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Environmental Protection in the Federal Coal Leasing Program

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Foreword

This report responds to a request by the House and Senate Committees on Appropriations, as mandated in the Conference Committee Report on the Department of the Interior and Related Agencies Appropriations Bill for fiscal year 1984, to assess the ability of the Federal coal leasing program to ensure the development of leases in an environmentally compatible manner. This study builds on earlier OTA reports, *An Assessment of the Development and Production Potential of Federal Coal Leases* and *The Direct Use of Coal,* and will contribute to future work on surface mine reclamation.

The assessment addresses the recent controversy surrounding the implementation of the environmental protection aspects of the Federal coal leasing program. It discusses the adequacy of the regulatory provisions of the program to ensure the environmental compatibility of Federal lease tracts, including the 1982 changes in program policy and regulations. The Bureau of Land Management's implementation of the leasing program legislation and regulations is evaluated, with emphasis on the adequacy of data and analyses to support land use planning and environmental impact assessment. The report assesses the characteristics of tracts proposed for leasing since 1979, to determine whether any of those tracts will be particularly difficult to develop under current environmental laws and regulations. It also assesses the potential for cumulative environmental impacts upon the development of several lease tracts in one area. Finally, the report presents policy options Congress could consider that seek to restore predictability and stability to the leasing program.

In the course of this assessment, OTA drew on the expertise of many individuals and organizations. In particular, we are grateful for the generous assistance of the workshop participants and the project's contractors, who prepared background analyses. We would also like to acknowledge the efforts of the numerous reviewers who gave their time to ensure the accuracy and comprehensiveness of this report. Finally, we are especially grateful to the Bureau of Land Management and its field personnel, without whose cheerful and candid cooperation this assessment would not have been possible.

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Overview

Following a decade of public debate, consensus was reached in 1979 on a Federal coal leasing program considered adequate to ensure protection of the environment upon development of leased tracts. **The basic framework of that program—the legislative mandates and the concept of a tiered structure of land use planning, activity planning, and mine permitting—are still workable and capable of ensuring environmental protection. However, 1982 shifts in the policy underlying the leasing program—as evidenced by changes in the implementing regulations—have shaken that consensus. While OTA did not discover any "fatal flaws" that would absolutely preclude mining on recently leased tracts, we conclude that the recent policy changes very likely have raised the cost and difficulty of ensuring environmental compatibility, and have increased the risk of adverse environmental impacts should those tracts be developed. As a consequence, public confidence in the environmental soundness of the Federal leasing program has decreased.**

The planning processes during which tracts are continuously evaluated for their acceptability for leasing have become too unpredictable and unsystematic to assure compliance with the environmental mandate. There are two basic aspects of the recent policy and program changes that contributed to this unpredictability:

First, the high leasing rates—the large quantity of coal to be offered for lease combined with inflexible lease sale schedules—of the past 3 years taxed the resources of the Bureau of Land Management (BLM) beyond the point where they could adequately assess the acceptability of the tracts proposed to be offered. Even without compressed planning and analysis schedules, BLM's assessment capability already was taxed by field personnel rotations and turnovers, which resulted in a loss of "institutional memory" and contributed to inadequate data and analyses. Consequently, decisions about acceptability have been deferred past the land use and early activity planning stages, where they are scheduled to be made, to the Secretarial decision or mine permitting stage. Tracts have been carried forward to the lease offering without adequate data and analyses to make a fully informed decision about their environmental compatibility. Decision deferrals also have led to overuse of lease stipulations (conditions placed on a lease) to address uncertainties about impact mitigation requirements. In some instances, tracts were removed prior to sale by mechanisms that were unrelated to the leasing process. Further, the quality and quantity of data and analyses vary widely among regions, among tracts within a region, and between sales within a region.

Second, changes in program regulations in 1982 reduced the effectiveness of the environmental protection measures that contributed to the consensus on the 1979 Federal coal leasing program. The 1982 regulations no longer **require**—prior to the environmental impact statement—the use of a "threshold" concept for determining whether potential cumulative impacts are severe enough to warrant dropping tracts from further consideration for leasing. In addition, most **regulatory** standards for the adequacy of data and analyses were eliminated, adding to the uncertainty about the acceptability of proposed tracts. Preparation of Resource Management Plans (required under the Federal Land Policy and Management Act of 1976 and the Federal Coal Leasing Amendments Act of 1976) was given lower priority when the 1984 deadline for their completion was eliminated, allowing indefinite reliance on existing land use plans prepared under earlier legislative mandates and updated or amended to meet the 1976 requirements. The latter do not constitute the sort of "fresh-start" comprehensive land use planning envisioned in the current statutory framework. Their continued use increases the **risk** of adverse environmental impacts occurring if a leased tract is developed, and adds to the perception that BLM data and analyses have been inadequate to support planning and leasing decisions.

Program Improvements

An environmentally (and economically) sound leasing program is an important part of the Nation's energy future and of public land manage-

ment policy. Unless reasonable public expectations about "soundness" are satisfied, however, an effective and predictable Federal coal leasing program is not likely. The recent actions taken by the Department of the Interior to review the leasing program are a positive step toward decreasing environmental risk and regaining the public consensus about the soundness of the program, and priority should be given to their rapid completion and implementation. However, there are a number of other measures identified by OTA that also can help to ensure environmental protection and compliance with the existing statutory mandates, reduce the environmental risk of leasing decisions, maintain a predictable and stable leasing process, and restore public confidence in the environmental soundness of the leasing program.

1. **Lower but steady leasing rates** would make the land area that has to be evaluated for coal leasing in a given period of time more manageable, reduce the number of tracts to be offered at one time and therefore the probability that environmentally sensitive tracts would be leased, and allow all participants in leasing, including the industry and affected communities, to plan more effectively for leasing activities.
2. **Decentralizing decisionmaking authority** on tracts and tonnages to be offered and on what schedule to the Regional Coal Team or BLM State Office level, and **reorganizing leasing regions to match State boundaries,** would improve the sensitivity of leasing decisions to State and local needs and priorities.
3. **Improving the effectiveness of public participation** through efforts to increase public awareness **and** understanding of, and involvement in, the planning and leasing process also could improve the environmental soundness of, and public confidence in, the leasing program. **In this context, it is very important to accommodate the environmental and socioeconomic concerns of special interest groups such as Indian Tribes, States and communities, and farmers and ranchers when carrying out lease planning activities and eventual mine development.**
4. **Completion of adequate Resource Management Plans** by BLM (and the Forest Service) would ensure that comprehensive areal land use planning is completed before activity planning for a lease sale and is adequate to support informed decisions on tract acceptability for leasing. It also would help ensure that preliminary cumulative impact assessments are incorporated in general land use planning decisions. **In this context, it is important that BLM planning be coordinated more closely with that of the Forest Service and other Federal agencies, and with State and local plans, to ensure that coal leasing does not undermine the goals of other programs.**
5. **The data and analyses that support planning and leasing decisions** also must be improved before environmental risk can be reduced and public confidence restored. Compilation of a comprehensive data base, evaluation of the amount of data and analysis needed at each decision stage, and expansion of ways to use data and analyses from industry and other participants in leasing are some ways such an improvement could occur without significant increases in BLM resources. Continued research on mitigation and reclamation techniques and on the use of the threshold concept for cumulative impact analysis also would make planning more effective. In addition, greater encouragement and incentives for experienced, qualified personnel to remain in the field could significantly improve the quality of data and analyses.
6. **Guidelines and standards for the adequacy of pre-sale data and analyses** at **all** stages in the leasing process should be incorporated in the program regulations. Regulatory standards and guidelines would be more predictable, would provide better guidance to field personnel, and would be more intelligible and accessible to other participants in the leasing process than the current guidelines, which reside primarily in BLM internal memoranda.
7. **A workable threshold concept for estimating cumulative impacts** should be developed and included in the regulatory requirements for evaluating tract acceptability during land-use planning and for tract ranking, as well as in the environmental impact statement.

8. **Policies and procedures for effectively using lease exchanges** to protect environmentally sensitive tracts should be established. It is necessary to clarify when such exchanges, which can be a useful tool for reducing environmental risk, can be undertaken and how.
9. **Policies and procedures for leasing coal lands where the Federal Government does not own or manage the surface** (split estate lands) need to be evaluated to resolve the uncertainty about the effectiveness of land use and activity planning and pre-lease environmental protections on such lands, and to ensure that BLM procedures for split estate areas balance public concerns and surface owner interests adequately.
10. **Procedures for environmental assessment of Preference Right Lease Applications** need to be evaluated to determine if they provide adequate environmental protection and to ensure that they are consistent across regions.

It is important that the Department of the Interior give priority to establishing an effective, predictable, and stable leasing program that reduces the environmental (and economic) risk of leasing decisions, and that allows the industry to plan confidently for acquisition of coal reserves, the environmental community to be confident that leasing decisions will be in accord with legislative requirements, and, most importantly, the owners of the resources—the citizens of the United States—to be confident that Federal lands are managed in the Nation's best interests.

Chapter 1

Introduction

Chapter 1
Introduction

Since 1920, the Department of the Interior (DOI) has administered a leasing program that allows the private sector to develop federally owned coal resources. A lease grants to the lessee the exclusive right to obtain a mining permit for, and to mine coal on, the lease tract, subject to the terms of the lease and permit and to applicable Federal and State laws. Historically, leases have been issued by two methods: competitively, to the highest bidder at a lease sale; and noncompetitively, to prospectors who discovered commercial coal reserves and submitted an application for a "preference right" lease. About half of all pre-1976 leases were issued under each method.

In 1970, a Bureau of Land Management (BLM) study of the Federal coal leasing program found that, since 1955, the amount of coal under lease had increased sharply while the amount of production from Federal leases had declined (3). In 1971, in response to this study, BLM imposed an informal moratorium on the issuance of new leases. The purpose of the moratorium, which was made formal by Secretarial order in 1973, was to provide time to reassess Federal coal leasing policies. Over the next several years, public debate focused on issues related to the size, timing, and location of new leasing, and the relation of coal development to environmental resource values.

In 1973, environmental groups sued DOI over the lack of a comprehensive regional environmental impact statement (EIS) for coal development in the Northern Great Plains. In 1976, the Supreme Court held in *Sierra Club* v. *Kleppe* that, once a Federal action is pending, the National Environmental Policy Act may require a comprehensive impact statement covering several related projects pending at the same time (6). In 1975, while this suit was under appeal and while Congress was considering changes to mineral leasing legislation, DOI released the final programmatic EIS for a new coal leasing system—the Energy Minerals Activity Recommendation System (EMARS) (1). The EMARS was an integrated planning process for lease sales that involved annual nominations for coal leasing areas by the industry and the public. The program was opposed by the Western governors and by agricultural and environmental interest groups. In 1977, a Federal District Court found the programmatic EIS to be inadequate and enjoined DOI from implementing EMARS (except for leases needed to maintain production at an existing mine or to meet existing contracts for coal) until the requirements of the National Environmental Policy Act were met (4). This decision applied to both competitive leases and preference right lease applications (PRLAs).

Public concern and debate about the structure and management of the leasing program led to congressional hearings and to approval of the Federal Coal Leasing Amendments Act of 1976 (FCLAA; Public Law 94-377) and the Federal Land Policy Management Act of 1976 (FLPMA; Public Law 94-579). In FCLAA, Congress substantially overhauled provisions of the Mineral Leasing Act of 1920 as it applies to Federal coal lands, including repeal of the noncompetitive preference right leasing system, provisions for the consolidation of leases into "logical mining units" (LMUs), a 10-year limit for diligent development of leases, a requirement for continuous operation on each lease, and preparation of a comprehensive land use plan before coal lease sales. FCLAA also requires lessee's to ensure compliance with the Clean Air and Water Acts.

FLPMA provides the statutory framework for BLM's overall land use planning. The act requires BLM's comprehensive land use planning program to maintain an up-to-date inventory of public lands and their resources, giving priority to the designation and protection of areas of critical environmental concern; project future uses of public lands and resources; and provide for the management of Federal lands in accordance with the principles of multiple use and sustained yield, considering the relative scarcity of the resource values involved and the availability of alternative means for realization of those values.

These acts were followed a year later by the Surface Mining Control and Reclamation Act of 1977 (SMCRA; Public Law 95-87), which requires companies to submit a detailed mining and reclamation plan and obtain a surface mining permit prior to opening a mine. SMCRA also established performance standards to assure that surface coal mining operations would be so conducted as to mitigate damage to the mine site.

The final law which bears directly on environmental protection on Federal coal lands is the National Environmental Policy Act of 1969 (NEPA; Public Law 91-190). NEPA requires all Federal agencies to prepare a detailed statement on the anticipated environmental effects of every ". . . major Federal action significantly affecting the quality of the human environment. . . ." Regulations to guide the implementation of NEPA have been promulgated by the Council on Environmental Quality (CEQ). A large body of Federal case law has further defined NEPA requirements, particularly with regard to the scope and content of EISs.

A comprehensive Federal coal leasing program implementing these statutes was instituted in 1979, following the preparation of a programmatic EIS under NEPA (2). The first lease sales under the new program were held in 1981 and 1982 (see table 1). In 1982 and 1983, DOI revised the regulations implementing the program to reflect a departmental shift in policy toward making more coal available for lease, to eliminate duplicative regulations, and to streamline the leasing process in order to facilitate lease sales. The changes in leasing policy and certain aspects of the sales held since 1981 have become controversial. In particular, some groups have charged that the Federal Government did not receive fair market value for the coal, and that the environmental protection provisions of the leasing program had been softened and were not being implemented fully or would not be followed when the coal is developed.

As a result of these concerns, in mid-1983, Congress mandated the establishment of an Advisory Commission to review Fair Market Value for Federal Coal Leasing. In the fiscal year 1984 Interior and Related Agencies Appropriations Bill, almost all leasing was suspended until 90 days after completion of the Fair Market Value Commission Report (delivered on Feb. 17, 1984). The Conference Committee Report on that bill specified that:

> . . . the managers will direct the Office of Technology Assessment to provide the Congress with an assessment of the [Federal coal leasing] program's ability to ensure the development of coal leases in an environmentally compatible manner (7).

Subsequently, OTA received a formal letter of request from the Senate and House Appropriations Committees, and their Interior subcommittees, which indicated that the conferees believed that OTA could provide an independent analysis of the leasing program in a timely manner because of OTA's previous report on Federal coal leasing—*An Assessment of the Development and Production Potential of Federal Coal Leases* (5). The letter of request repeated the language from the Conference Committee Report, and went on to say:

Table 1.—Lease Sale Schedules

Sale	Sale date	Leasing target/level	Offered	Sold
		(millions of tons)		
Green River-Hams Fork[a] Round I	1/81;4/81;6/81	416	573	573
Uinta-Southwestern Utah[a] Round I	7/81;2/82;5/82	322	555	88
Powder River Round I	4/82;10/82	2,360	1,681	1,580
Fort Union[b] Round I	9/83	800-1,200	543	102[b]

[a] In place reserves.
[b] Bid received, but not sold because of lease sale ban in fiscal year 1984 Interior Appropriations Bill.

SOURCE: Office of Technology Assessment, from Bureau of Land Management documents.

> In particular, we want to ensure that the public lands suffer no unmitigated or undue environmental problems when recently leased Federal coal tracts are developed. Are there characteristics of some of these tracts that would make development difficult under current environmental laws and regulations? When all characteristics are considered, is the cumulative environmental effect cause for concern? We are also interested in the pre-sale planning being carried on by the Department of Interior. In your judgment, are data and research about the tracts adequate to base a decision on whether the tracts can be developed in an environmentally compatible manner? If not, we would appreciate your suggestions.

OTA designed this study to respond to the five basic questions posed in the letter of request. The scope of the study was defined narrowly due to the time schedule specified by the requesting committees. "Environmental compatibility" was interpreted by OTA to mean "compatible with current environmental laws and regulations," such as the Clean Air and Water Acts and NEPA. (These laws are described briefly in app. A to this report.) While this report evaluates the adequacy of **DOI and BLM** programs and regulations in light of the full range of statutory mandates, OTA could not explicitly review the adequacy of all the laws mentioned in appendix A. Thus, the report generally assumes that programs external to DOI are adequate to protect environmental values on public lands.

Second, the study was restricted, for the most part, to issues related to the physical environment. In most areas, impacts of coal mining on the human environment, including social and economic impacts, and surface owner consent, are of equal concern. These issues are sufficiently complex that it would not have been possible to address them adequately in this report. However, where these are the **predominant** concerns for an interest group or region, they are noted (e.g., Indian Tribes).

Third, OTA limited its analysis to the coal **leasing** program, and did not consider the permitting process or other coal development issues such as transportation, or the siting and operation of conversion facilities (e.g., powerplants, synfuels plants). Fourth, OTA's analysis was limited to the five major Western coal regions where most of the environmental controversy has arisen. These regions: Fort Union, Green River-Hams Fork, Powder River, San Juan River, and Uinta-Southwestern Utah, are shown in figure 1.

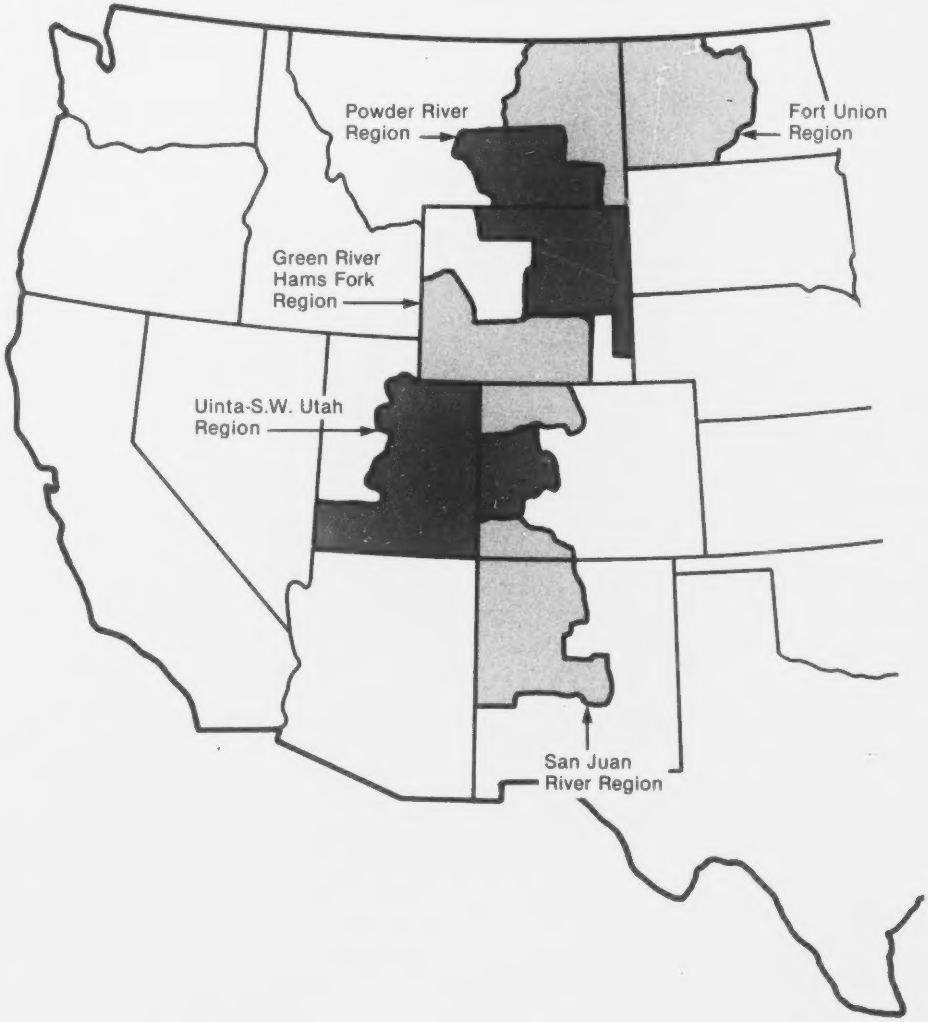
To assist in the formulation of OTA's response to the letter of request, background papers were prepared that documented the leasing program and its implementation to date in five Western coal regions. In particular, those papers evaluated BLM's pre-sale planning and environmental assessment and documented the controversy surrounding the environmental aspects of the leasing program based on extensive interviews with BLM personnel, State government representatives, coal companies, and public interest groups in the five regions. The findings of those reports were reviewed at an OTA-sponsored workshop (see front of report for a list of workshop participants). The workshop also included detailed discussion of the full range of environmental issues raised by the participants in the leasing program.

This report is the product of the extensive interviews, background reports, and workshop discussions on the environmental aspects of the Federal coal leasing program. The report outlines DOI's **pre-lease** environmental assessment and planning process, describes how that process was implemented in the five Western coal regions, discusses the issues that have been raised with respect to the adequacy of that process and its implementation, and reviews policy options that would allow leasing to proceed in an environmentally compatible manner.

The report is organized as follows:

- chapter 2 presents OTA's findings on the questions posed in the Conference Committee Report and the letter of request and analyzes policy options for consideration by Congress to improve the leasing program's ability to ensure that leasing decisions will be environmentally sound;
- chapter 3 describes the Federal coal management program and its provisions for environmental protection, as established in laws and regulations; and

Figure 1.—Five Western Coal Regions


Powder River Region
Fort Union Region
Green River Hams Fork Region
Uinta-S.W. Utah Region
San Juan River Region

SOURCE: Office of Technology Assessment.

- chapter 4 discusses the issues that have been raised about the environmental aspects of the leasing program, and outlines OTA's findings on those issues.

The background papers documenting the structure of the leasing program and its implementation in the five Western coal regions are presented as appendixes in a separate volume.

CHAPTER 1 REFERENCES

1. Bureau of Land Management, *Final Environmental Impact Statement, Proposed Federal Coal Leasing Program,* FES-75-80 (Washington, D.C: U.S. Government Printing Office, 1975).
2. Bureau of Land Management, *Final Environmental Statement, Federal Coal Management Program* (Washington, D.C: U.S. Government Printing Office, April 1979).
3. Bureau of Land Management, *Holdings and Development of Federal Coal Leases* (Washington, D.C: U.S. Department of the Interior, 1970).
4. *NRDC* v. *Hughes,* 437 F.Supp. 981 (D.D.C. 1977).
5. Office of Technology Assessment, U.S. Congress, *An Assessment of the Development and Production Potential of Federal Coal Leases,* OTA-M-150 (Washington, D.C: U.S. Government Printing Office, December 1981).
6. *Sierra Club* v. *Kleppe,* 327 U.S. 390 (1976).
7. U.S. House of Representatives, *Making Appropriations for the Department of the Interior and Related Agencies for the Fiscal Year Ending September 30, 1983,* Conference Report to accompany H.R. 3363 (House Report No. 98-399, 98th Cong., 1st sess., p. 22).

Chapter 2

Findings and Policy Options

Chapter 2

Findings and Policy Options

Competitive leasing of Federal coal resumed in 1979 following an 8-year moratorium, several lawsuits, and congressional approval of legislation to ensure that leasing decisions would be based on comprehensive planning and environmental impact assessment, that leases would be developed in a timely manner, and that the public would receive a fair return on publicly owned lands. Consensus among all parties interested in leasing was reached in 1979 on a set of regulations and policies to carry out that legislative mandate, and the first round of lease sales was held in 1981 (see table 1 in ch. 1).

Changes made in 1982 and 1983 to the regulations and to other Department of the Interior (DOI) policies and actions implementing the leasing program weakened that consensus. Alterations in the method of determining regional leasing levels increased the number of tracts to be offered for lease beyond what the Bureau of Land Management (BLM) could review for environmental compatibility in the time allotted, and, as a result, BLM was unable in many cases to perform adequate pre-sale planning and environmental assessment. At the same time, critics contended that the high leasing levels and irregularities in tract valuation prevented the government from receiving fair market value for the coal.

In response to these allegations, in mid-1983 Congress ordered DOI to appoint a Commission to study issues related to fair market value. Shortly thereafter, the Senate and House Appropriations Committees asked the Congressional Office of Technology Assessment (OTA) to evaluate the environmental aspects of the leasing program. In particular, OTA was asked:

1. Is the Federal coal leasing program adequate to ensure the development of leases in an environmentally compatible manner?*
2. Are pre-sale data and research about recently leased tracts adequate to base a decision on whether those tracts can be developed in an environmentally compatible manner?
3. Are there characteristics of some of the recently leased tracts that would make development difficult under current environmental laws and regulations?
4. When all characteristics are considered, are cumulative environmental effects cause for concern?
5. What are technical and policy options for mitigating environmental concerns?

This chapter presents OTA's responses to these questions. Detailed documentation of the issues and findings summarized below may be found in chapter 4.

1. Is the Federal coal leasing program adequate to ensure the development of coal leases in an environmentally compatible manner?

A Federal coal leasing program (described in ch. 3) was instituted in the late 1970's following an 8-year moratorium on leasing that had been imposed in response to economic and environmental concerns. Elements of that program that address the latter include requirements for comprehensive land use planning, site-specific analysis of potential lease tracts, and regional environmental impact assessment before a lease offering. These requirements are implemented through a tiered system of data collection and analyses, in which the level of detail increases and the amount of land under consideration decreases as land moves closer to actual development (see fig. 2). As described in chapter 3, this tiered system begins with land use planning, when **all** potential resource uses on Federal lands and opportunities for development of particular resources are identified; proceeds through planning for a specific activity (e.g., a coal lease sale), including preparation of an environmental impact statement (EIS); and culminates after leasing in review of an application for a surface mining permit, which includes a detailed tract-specific mining and reclamation plan (see fig. 7 in ch. 3).

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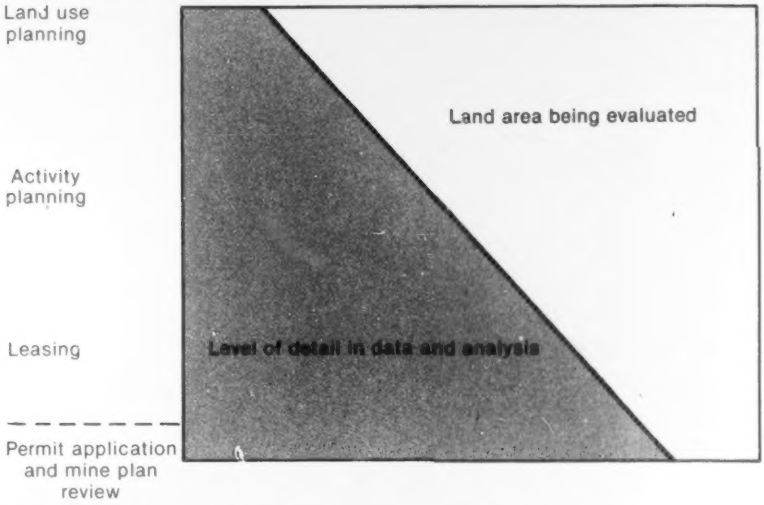
*The phrase "environmentally compatible" was in the Conference Committee Report on the DOI Appropriations Bill, which mandated this assessment. OTA has interpreted this phrase to mean "in a manner compatible with current *environmental* laws and regulations" (other than those directly related to the leasing program; see ch. 1).

Figure 2.—Tiered Structure Concept of Data and Analysis


Land use planning
Activity planning
Leasing
Permit application and mine plan review
Land area being evaluated
Level of detail in data and analysis

SOURCE: Office of Technology Assessment.

Although the majority of environmental impacts result from actual mine development, the environmental implications of land use planning and leasing decisions also are important in terms of the priority assigned to coal management relative to other potential resource uses (e.g., grazing, timber, watershed, recreation, wildlife, other fuel or mineral development), and the degree to which tracts with a high potential for environmental damage are screened out prior to the lease sale.

OTA found that, *in principle,* the statutory framework and the tiered system concept developed to implement that framework are capable of assuring adequate environmental protection during the development of Federal coal leases. The framework is the result of at least 5 years of extensive debate and negotiations among the various parties interested in the development of an economically and environmentally sound Federal coal management program (e.g., DOI, Forest Service, Fish and Wildlife Service, coal companies and their consumers, environmental and public interest groups, State governments, and Congress). While each of those groups has a "wish list" of the elements of a statutory framework that would be perfect from their perspective, there is consensus among them that the existing legislative mandates are, in theory, workable and adequate to ensure environmentally compatible development of Federal coal leases.

However, *in practice,* implementation of that framework has fallen short. OTA found that some aspects of the 1982 rule changes significantly increased the probability (i.e., risk) that environmentally sensitive tracts would be leased and eventually mined, and weakened public confidence in the environmental soundness of the Federal coal leasing program. These changes included a substantial increase in leasing levels; the elimination of most regulatory guidelines and standards for data adequacy; the elimination of regulatory authority to drop tracts (prior to the EIS) from further consideration for leasing when a threshold level of cumulative impacts is reached; the elimination of several opportunities for public participation, including public comment on proposed leasing levels and on application of the unsuitability criteria; and the elimination of the December 1984 deadline for completion of comprehensive land use plans pursuant to the Federal Coal Leasing Amendments Act (FCLAA) and the Federal Land Policy and Management Act (FLPMA).

A second question about the adequacy of BLM's implementation of the environmental protection aspects of the Federal coal management program is whether BLM **field** activities are consistent with the legal framework. **OTA found that time, staff, and budget constraints have prevented BLM field personnel from satisfying the full intent of the statutory mandate.** This was evidenced when decisions required to be made during land use planning were deferred to activity planning or to review of the surface mining permit application. In effect, deferral of decisions assumes that an area eventually will be found acceptable for mining. As a result, decision deferral has led to overuse of individual lease stipulations to address uncertainties in mitigation requirements, and has detracted from the consistency and predictability of the leasing process. While BLM needs some flexibility to adapt to changing conditions, all participants in leasing need a program that is implemented in a stable and consistent manner.

When BLM was not able to comply fully with regulatory requirements, the primary cause was time constraints resulting from high leasing rates—the combination of inflexible lease sale schedules and a substantial increase in the number of tracts to be evaluated for each sale. This problem could be alleviated with increased budget and staff allocations to land use planning and activity planning. However, this option is inconsistent with current budget policy and does not address the burden high leasing rates place on other participants in the coal leasing program. Alternatively, **the leasing rate could be lowered to accommodate existing staff and budget resources, and important concerns ranked in planning and environmental assessment and resources allocated to those concerns on a priority basis, to facilitate higher quality and more consistent planning efforts by all participants in leasing.**

A comprehensive land use policy for Federal lands also would help close the gap between theory and practice in the coal leasing program. While the elements of such a policy are in place in the basic legislation, additional guidance is needed on the relative importance to be placed on various uses of, and resource values on, Federal lands. DOI's ongoing reevaluation of its own priorities for allocating resources would aid in the development of such a policy, and the early completion of this effort should be encouraged. **Congressional guidance on land use policy consistent with FCLAA, FLPMA, and the National Forest Management Act, and on the allocation of BLM resources to data collection and analysis at different stages of the leasing process, could be offered through the authorization and appropriation process.** Additional coordination also is needed among the various Federal surface management agencies (e.g., BLM, Forest Service, Bureau of Indian Affairs). For example, potential leasing areas within National Forests are not yet covered by Forest Land and Resource Management Plans (currently scheduled for completion and approval by September 1985), preventing consistency between BLM and Forest Service planning decisions (see fig. 3).

2. Are pre-sale data and research about recently leased tracts adequate to base a decision on whether those tracts can be developed in an environmentally compatible manner?

Determination of the adequacy of pre-sale data and analyses is difficult for three reasons. First, **the current program regulations provide insufficient guidance or standards for determining when data and analyses are to be deemed adequate.** As a result, each participant in the leasing process applies his own standards of adequacy, which vary widely. Second, **existing analyses of data adequacy often focus on whether a decision is supported by the data and research, not whether the supporting analysis is of high quality in its own right.** Third, **judging the adequacy of data raises the question of at what stage in the coal management program particular decisions should be made.** The industry would prefer to see most environmental questions resolved at the mine plan stage, while others want most such questions—especially final application of the unsuitability criteria*—answered before a tract is leased. As noted previously, OTA found that the tiered system concept of evaluating environmental impacts could provide a workable balance among these concerns **if it were implemented in a manner consistent with the legislative mandate.**

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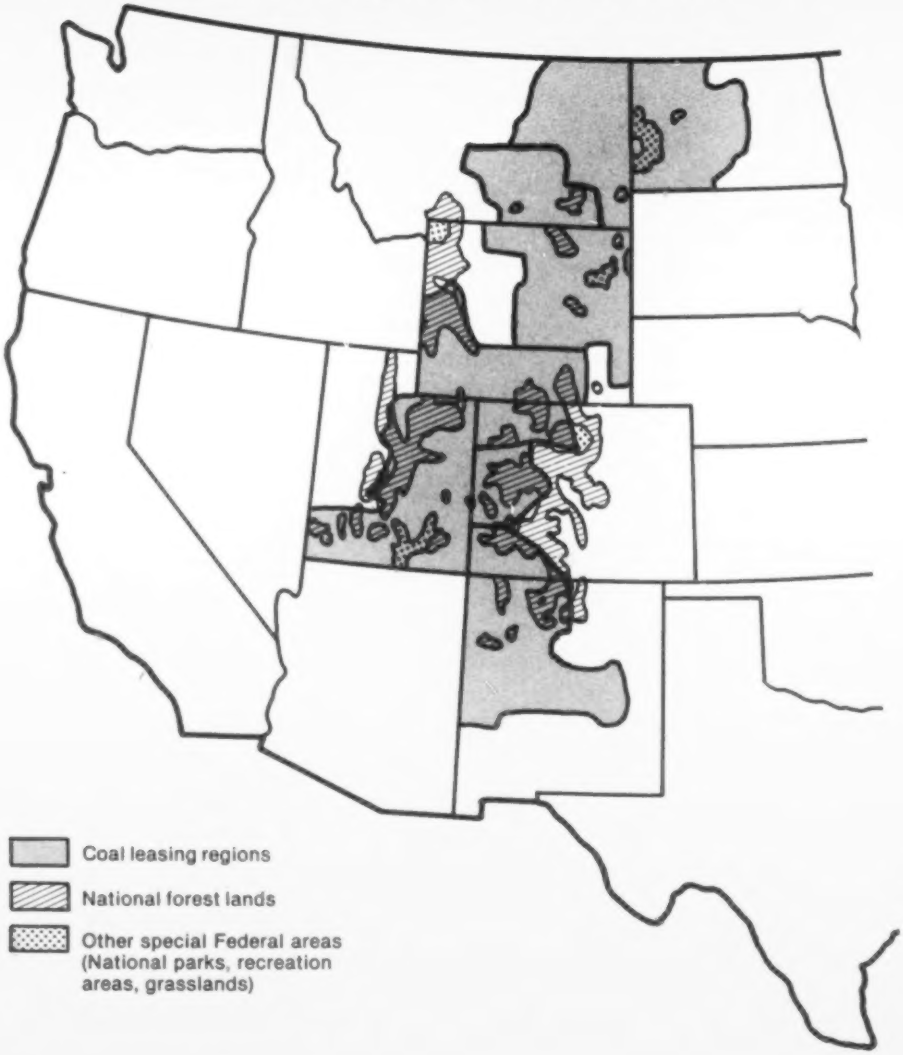
*Except for the alluvial valley floor criterion, which can be deferred to permitting.

Figure 3.—Approximate Overlap Between Coal Leasing Regions and National Forests and Other Special Federal Management Areas


▭ Coal leasing regions
▨ National forest lands
▒ Other special Federal areas (National parks, recreation areas, grasslands)

SOURCE: Office of Technology Assessment

The only detailed regulatory guidelines or standards in the program regulations by which to judge the adequacy of data apply to the unsuitability criteria. In general, that standard requires the use of "the best available data that can be obtained **given the time and resources available to prepare the plan,"** plus an indication of the adequacy and reliability of the data involved, and, if the criteria cannot be applied due to inadequate or unreliable data, a discussion of the reasons therefor, and an assessment of when "the data needed to make an assessment with reasonable certainty would be generated" (43 CFR 3461.3-1(b)(1); emphasis added). Furthermore, this standard specifies that no lease tract may be analyzed in a final regional lease sale EIS without "significant data material to the application to the tract of each [unsuitability] criterion," but it also allows the inclusion of tracts when data are lacking for the application of the criteria for only a portion of the tract, and if BLM determines that lease stipulations or permit conditions could "avoid any problems which may result from subsequent application of the criterion or exception" (43 CFR 3461.3-1(b)(2)).

It is OTA's view that this standard is too vague to provide meaningful guidance to BLM personnel on the level of data and analyses needed to support application of the unsuitability criteria and thus cannot be applied effectively to other decisions in the leasing process. Furthermore, this standard may actually be counterproductive in that it excuses the primary cause of BLM's inability to comply fully with the statutory and regulatory requirements—insufficient time and resources—and explicitly allows deferral of unsuitability decisions on portions of tracts to the Secretarial decision and beyond and therefore could promote the overuse of lease stipulations and permit conditions.

As a result, OTA proposes that BLM's data and analyses be considered "adequate" if they: 1) promoted a reasonable consensus among the participants in the leasing process (i.e., did not result in substantial controversy over insufficient data); 2) did not necessitate decisions to accommodate gaps in data and analysis (e.g., deferral of decisions beyond the time when they were required to be made, or lease stipulations requiring the collection of data that should have been available for the evaluation of a tract's acceptability for leasing); and 3) supported the decision made.

Based on this definition, it is OTA's judgment that, in many cases, BLM's pre-sale data and analyses have been inadequate to base a decision on whether recently leased tracts (and those proposed to be offered in future lease sales) can be developed in an environmentally compatible manner. In literally all coal leasing regions criticisms about insufficient data upon which to base decisions about unsuitability criteria or multiple-use tradeoffs have been documented (see ch. 4). Because the supporting data and analyses were inadequate, decisions about tracts' acceptability for leasing that should have been made during land use planning were deferred to activity planning, the Secretarial decision, or mine plan review.

Because the tiered structure of the environmental decisionmaking process is inherently dependent on a succession of increasingly detailed data and planning bases, the quality of decisions made at one tier suffers if data were not available in sufficient detail to support the required decision at the next lower tier. This concern extends to decisions that are deferred to the mine plan stage, in part because decisions at that stage are intended to accommodate coal development, rather than exclude areas from mining. While recognizing the importance of ensuring environmental protection at the mine permit review stage and during mine development and reclamation, OTA was unable to evaluate those aspects of the Federal coal management program within the confines of this assessment.

Although the data base and analyses were adequate for some decisions by the time the final EIS for a regional lease sale was completed, deferral of data collection and analysis to activity planning means the data were not available early on to be incorporated in comprehensive land use planning and the identification of opportunities for the development of coal resources, or in RCT tract rankings. Moreover, **reliance on tract-specific data and analyses for some areas raises problems because the lack of data at an equivalent level of detail for an entire leasing region means that data and analyses may not provide a perspective on the *regional importance* of resource values.**

The quality of data and research vary widely among regions, among tracts within a region, and between sales within a region. Regional differences can be attributed in part to the level of coal development activity in the past, and therefore the availability of data on the impacts of mining, and in part to the degree to which future coal development was anticipated in early planning documents. For example, the San Juan River Region, which generally is considered to have had the most problems with data adequacy, did not anticipate a high level of leasing activity and consequently was faced with a massive data collection and analysis effort given the high regional leasing level. Differences in the quality of data among tracts within a region often can be traced to the availability of data from sources other than BLM (e.g., an operating mine adjacent to a proposed lease tract), or to the difficulty of data collection and planning when BLM does not manage the surface. Finally, better information typically is available for subsequent lease sales than the first round sale because of the greater amount of time available for data collection and analysis and the ability to build on planning and assessments conducted in support of the earlier sale.

The primary cause of the inadequacy of data and analyses was high leasing rates—the ratio of leasing levels and lease sale schedules. High leasing rates increased the number of tracts that had to be evaluated during land use and activity planning without giving field personnel additional time in which to complete those evaluations. Consequently, some land use planning decisions either had to be deferred or made on the basis of available data. In other instances, additional time was taken to complete land use planning, which resulted in less time for activity planning—primarily site-specific analyses—which detracted from the adequacy of data and analysis at that stage. High leasing rates also strained the resources of other participants in the leasing process. For example, the Forest Service was unable to complete its required planning in time to meet BLM's sale schedule in the Uinta Region. It should be noted, however, that **even with perfect data and analyses, high leasing rates—in and of themselves—increase the probability that environmentally sensitive tracts will be leased because high leasing levels mean that a greater number of tracts must be offered for lease.**

Other policies that have contributed to data inadequacy are: continued reliance on pre-FLPMA Management Framework Plans (and Forest Service land use or unit plans) that have been updated or amended to reflect leasing activity, rather than giving priority to the preparation of comprehensive new areal planning documents (Resource Management Plans); reduced budget allocations for new resource inventories, which forces BLM field personnel to rely on data available to them, which may be out of date; a failure to consistently seek out and consider data available from sources other than BLM (e.g., mine plans and operating mines, other Federal and State agencies); and personnel rotations within BLM that constrained the development of an institutional memory. The last point—continuity among qualified, experienced personnel—is especially critical to the consistency of data and analyses over time, and to the maintenance of an adequate understanding of the coal regions and the potential impacts of mineral development in those regions. The effects of the policies listed above are compounded by factors such as the lack of ways to make use of industry data and to include industry resources more during the planning stages; and the difficulty of access for data collection when the Federal Government does not own the surface.

3. Are there characteristics of some of the recently leased tracts that would make development difficult under current environmental laws and regulations?

Virtually all lease tracts have characteristics that might be considered by some to be incompatible with coal mining, ranging from present land uses, such as agriculture or timber management, that would be disrupted by mining, to environmental values that might be lost for at least several years due to mining (e.g., wildlife habitat; see tables 2 and 3). The tiered decisionmaking process for coal leasing is intended to screen out lands before a lease offering where it is clear that impact mitigation would not be possible, or where mining would interfere with other important resource values. However, the inadequacy of data and analyses discussed previously prevented effective implementation of the tiered structure concept. As a consequence, **less was known prior to leasing about the sensitivity or regional value of the environmental resources on these tracts than was desirable.** Moreover, the environmental screens have not always been interpreted as strictly or applied as consistently as intended in the 1979 program, in part because of the 1982 regulatory and policy changes, and in part due to insufficient data and analysis.

As a result of these and other factors, **environmentally sensitive tracts have been "carried for-**

Table 2.—Environmental Resources of Coal-Producing Regions

	Air quality	Water quantity and quality	Vegetation	Wildlife	Agriculture and land use[a]	Carrying capacity livestock[b]
Fort Union	Uniformly very good	Annual runoff: 1"/yr. Surface water availability limited except in major streams. Groundwater available in small quantities except in alluvial valleys where more abundant. Major streams: Missouri, Yellowstone, Knife.	Eastern: Wheatgrass, needlegrass. Western: Gramma, needlegrass, wheatgrass.	Varied wildlife: 87 species birds, 70 species mammals, 200 species fish, 20 species reptiles and amphibians. Federally protected species: 4 birds, 3 mammals.	Cropland constitutes 75% of N.E., 5% southern area. Elsewhere, Cropland: 37% Range: 54% Principal crops: wheat and grain.	8.2 acres/ A.U.M.
Powder River	Overall quality: generally good. Variations around populated areas, i.e., Colstrip, Mont. is a nonattainment area for TSP.	Annual surface water run-off: less than 0.5". Surface water limited except along major streams. Quality: variable. Groundwater availability and quality: variable. Major streams: Yellowstone, Big Horn, Powder, Tongue, Belle Fourche, and Musselshell.	Wyoming: Prairie shortgrass, grassland sagebrush. Montana: grassland sagebrush, and ponderosa pine.	Similar to Fort Union. Federally protected species: 3 birds, 1 mammal.	Grazing and ranching. Cropland: 5% Range: 88%	15.5 acres/ A.U.M.
Green River-Ham's Fork	Overall quality very good, however, Craig, Colo. and parts of Sweetwater, Colo., and Wyoming are nonattainment for TSP.	Annual runoff: Western half: 10-30" Eastern half: .1-2" Quality good in mountains and poor in basins. Major streams: Green, Yampa, Sweetwaters, Shoshone, Greybull.	Cold desert biome: sagebrush. Salt brush biome: greasewood, mountain shrub, evergreen forests, broadleaf forests.	53 mammal species. Large numbers of big game animals. Varied game and non-game fish species. Wild horse herds. Federally protected species: 1 fish, 3 birds, 2 mammals.	Cattle and sheep ranching, limited farming. Cropland: 4% Range: 70% Forests: 27%	9.3 acres/ A.U.M.
Uinta-Southwestern Utah	Rural air quality: very good. Urban areas: occasional problems during temperature inversions.	Annual runoff: 0.1-.5"/yr. Good water quality. Region contains numerous tributaries to the Colorado River: Green, White, Duchesne, Price, Dirty Devil, Paria, Escalante, & Virgin Rivers.	Vegetation varies with climate. Cold desert biome: salt brush and greasewood. Mountain Forest biome: pine, fir, spruce, and sagebrush.	Varied habitat supports many diverse species: 90 species mammals, 270 species birds, 26 species reptiles, 9 species amphibians Federally protected species: 3 fish, 3 birds, 2 mammals.	Desert shrubland and open woodland grazing. Crops: 3% Range: 62% Forests: 33%	8.3 acres/ A.U.M.
San Juan River	Overall quality generally good except around industrial areas. High SO_2 levels near powerplants.	Annual runoff: 0.1-0.5"/yr. Major streams: San Juan, Colorado, and Little Colorado. San Juan River is the only perennial stream in Federal lease block area. Ground waters are generally good, but levels are dropping.	Generally sparse vegetation. Lower elevations: grassland shrub and grasslands. Upper elevations: Pinyon, juniper and coniferous forests.	Habitat supports: 100 species mammals, 116 species birds, 28 species amphibians. Several are unique to region. Federally protected species: 1 fish, 4 birds, 1 mammal.	Cattle and sheep ranching. Range: 50% Forests: 45% Limited crops: corn, hay, wheat, cotton, and sugarbeets.	22 acres/ A.U.M.

[a] Percentages are of total land area. Only major land uses are listed.

[b] Refers to the ability of the land to support livestock. A.U.M. stands for animal unit month, which refers to the grazing requirements of an "averaged" livestock animal for 1 month.

SOURCE: U.S. Bureau of Land Management, *Final Environmental Statement, Federal Coal Management Program*, 1979.

Table 3.—Archaeological and Cultural Resources of the Western Coal Regions

Region	Archeological resources[a]	Major Federal parklands and forests resources
Fort Union	Much of the region has some identified archaeological value. A few areas have large sites and/or high site density. There is a high probability of disturbance to sites in Custer Co., Mont., and in Mercer, Williams, and Oliver Co's., N. Dak.	• Little Missouri National Grassland • Theodore Roosevelt National Memorial Park • Custer National Forest
Powder River	There is a high probability of disturbance to sites in Rosebud, Bighorn and Powder River Co's., Mont, and in Johnson and Campbell Co's., Wyo. Remainder of region considered to have some archaeological value.	• Devils Tower National Monument • 65 Sites eligible for, or currently enrolled on the National Register of Historic sites. • Thunder Basin National Grassland • Custer National Forest
Green River-Hams Fork	The region has some identified archaeological value. Many areas have not been surveyed.	• Flaming Gorge National Recreation Area • Dinosaur National Monument
Uinta-Southwestern Utah	There is a high probability of disturbance to Fremont and Anasazi sites in Emery, Kane and Garfield Co's., in Utah. Remainder of region considered to have some archaeological value.	• Capital Reef, Arches, Canyonlands, Zion, and Bryce Canyon National Parks • Cedar Breaks National Monument • Black Canyon of the Gunnison, and Colorado National Monuments
San Juan River	This region has been identified as having both great archeological and historical value. There is a high probability of disturbance to sites in the Chaco Canyon National Monument area.	• Mesa Verde National Park • 6 National Monuments

[a] Based on a survey performed by the National Academy of Sciences of 69 strippable coal areas in the West. Tables A.1, A.3, *Rehabilitation Potential of Western Coal Lands*, NAS, 1974.

SOURCE: Office of Technology Assessment.

ward" from land use planning to activity planning and the Secretarial decision on a lease sale, and final decisions on tract acceptability have been deferred to permit application review (e.g., tracts containing municipal watershed). **These decision deferrals, coupled with the factors noted above, increased the probability (i.e., risk) either that adverse environmental impacts will occur if a recently leased tract is developed, or that such tracts will be costly or difficult to develop and reclaim.** None of the recently leased new production tracts has been through the permit application review process, and thus no determinations about the technical and economic feasibility of mining and reclamation on those tracts have been made by permitting agencies. However, such determinations will be made eventually, and if a tract or a portion of a tract **cannot** be developed in a manner compatible with current environmental laws and regulations, then the Surface Mining Control and Reclamation Act of 1977 (SMCRA) does not allow a permit to be issued for that area.

While unable to determine whether the leased tracts are technically and economically reclaimable under SMCRA, OTA found no "fatal flaws" that would absolutely preclude mining on tracts that have been *leased* since 1979. In some cases, however, BLM carried tracts with what might be considered fatal flaws all the way through pre-lease planning and analysis, and scheduled them to be offered for lease, but withdrew them (often for reasons unrelated to the leasing process) at the last minute. For example, the Garrison tract in Fort Union contains two missile silos and several miles of control cable, which the Air Force considers to be a fatal flaw, but the tract was carried forward at the request of industry pending completion of an Air Force study on the buffer zones needed to protect defense installations from surface mining. The tract was dropped in the Secretarial Issue Document at the request of the Secretary of the Air Force because the study was not complete. Tracts that are dropped still are not necessarily considered absolutely unsuitable for mining; they may merely be removed from further consideration for leasing until additional research on mitigation and reclamation allows a final decision to be made.

However, differences in professional judgment do exist on both the relative importance of environmental resource values and the ability to mitigate environmental impacts on some tracts that were offered and/or leased or are under evaluation for leasing. For example, in the San Juan River leasing region, the paleontological community cannot agree on whether fossil deposits should be protected outright, or whether impacts can be mitigated and the scientific value of the fossils preserved through appropriate excavation techniques. In the Powder River Region, debate over the technical and economic feasibility of reclamation on several tracts led to the Tongue River Unsuitability Petition, which was denied because sufficient data will not be available to evaluate reclaimability until mining and reclamation plans are prepared by lessees.

A major source of the disagreement about the relative environmental sensitivity of recently leased tracts lies in the disagreement about the types of impacts that can be mitigated and the ability to reclaim surface mined land. Critics of the environmental safeguards in the leasing program argue that the **success** of reclamation on surface mined lands has yet to be demonstrated conclusively, and that the coal industry is overly optimistic about the prospects for successful reclamation. Therefore, they contend that where evaluation of a tract prior to leasing raises questions about its reclaimability, that tract should be withdrawn from leasing until additional reclamation experience is accumulated. Others argue that experience to date demonstrates there is almost no land that cannot be reclaimed **technically,** and very few (if any) types of impacts that cannot be mitigated, and the only question is whether mitigation and/or reclamation are **economically** feasible.* They see that as a business decision which should not be made for the lessee by a government agency or other group.

Due to the extremely detailed analyses that are necessary to evaluate reclaimability, OTA believes that only *estimates* of reclamation potential can be made before leasing. These estimates are incorporated in the Regional Coal Team's tract rankings, but are not necessarily a deciding factor since tracts given a "low" or "moderate" reclamation potential ranking have been carried forward for leasing. Furthermore, OTA found that debate among experts about the ability to mitigate particular types of impacts (e.g., hydrology, archaeological and paleontological resources, critical wildlife habitat) leads to disagreement about how strictly the environmental screens should be interpreted.

Such differences in professional judgment further confuse the public about the adequacy of environmental safeguards in the leasing program. Possible means of resolving these differences and improving public confidence in the environmental soundness of leasing decisions could include more stringent standards for screening tracts before leasing, which should result in offering fewer tracts about which there is substantial controversy. Continued research on impact mitigation, mining, and reclamation techniques, and dissemination of the results to interested parties also would help.

4. When all characteristics are considered, are cumulative environmental effects cause for concern?

There are three aspects to cumulative impacts: 1) when the total impacts on a particular tract are greater than indicated by the mere sum of individual impacts; 2) the total regional impact of mining on all leased tracts; and 3) the combined impacts of mining on several tracts located in the same area. The first aspect cannot be evaluated until the tracts have been included in a mine plan and permit application. **OTA finds the second aspect is a matter of concern because the high leasing rates increased the number of tracts to be evaluated in pre-sale planning (including the EIS) without increasing the resources available to perform such planning** (discussed earlier).

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*It should be noted that a tract has never failed to be permitted due to inability to demonstrate the technical or economic feasibility of reclamation, although permit application review has resulted in portions of tracts being closed to mining to mitigate particular types of impacts (e.g., buffer zones for wildlife habitat). As a result, deferral of unsuitability determinations to the permitting stage increases the risk that an environmentally sensitive tract will be mined.

OTA finds that the third aspect of cumulative impacts—the effects of several mines operating within the same area—also is cause for concern because the current regulations do not explicitly incorporate the assessment of such impacts early in the leasing decisionmaking process. The 1979 regulations incorporated a "threshold" concept during land use planning and tract ranking for determining when potential cumulative impacts were severe enough to warrant dropping tracts from further consideration for leasing or imposing mitigation requirements. Under the 1982 program, cumulative impacts still must be assessed in the regional lease sale EIS, which is prepared at the end of activity planning, in order to satisfy the requirements of the National Environmental Policy Act. However, explicit regulatory authority to impose mitigation requirements or drop tracts prior to the EIS when a threshold level of cumulative impacts is projected was eliminated in the 1982 rule changes. According to DOI, that authority was dropped because the threshold concept was not well understood and was never used. An additional concern here is a lack of agreement between BLM and other Federal surface management agencies (e.g., Forest Service) and State and local governments on the **significance** of projected cumulative impacts.

Most of the recently leased tracts were analyzed under the 1979 rules, which **did** include a threshold concept for screening out areas with a potential for significant cumulative impacts. Because that concept had never been applied, it is unclear whether the 1982 lease program will change the treatment of cumulative impacts.

OTA's view is that there is a *potential* for significant cumulative impacts if a number of mines were developed within an area. Drainage basin studies of lease areas prepared for BLM in support of pre-sale planning and environmental assessment raise concerns about cumulative hydrologic impacts in the Powder River, Green River-Hams Fork, and Uinta-Southwestern Utah regions (see fig. 4). Similarly, the San Juan second draft EIS indicates that development of the preferred leasing alternative could violate air quality standards, while an air quality study underway in Powder River suggests that surface mining will have adverse cumulative impacts on visibility and particulate concentrations.*

The design of mitigation measures for cumulative impacts typically is left to the permitting agency because detailed data on factors such as hydrology are not available until mine plan review. Yet that review is tract specific and may not capture cumulative effects from multiple mine development in an area. Furthermore, as noted previously, decisions at the permitting stage are more likely to result in mitigation requirements than the exclusion of areas from mining.

5. What are technical and policy options for mitigating environmental concerns?

An economically and environmentally sound coal leasing program is an integral part of national energy policy and public land management policy. In 1979, all participants in coal leasing reached consensus on the elements of a sound program. The soundness of that program—and underlying public confidence in the Department of the Interior—was undermined in 1982 when basic changes were made in program policy and regulations. Unless the reasonable expectations of all participants in that program about economic and environmental "soundness" are satisfied once again, competitive leasing will continue to be stalled because of the environmental and economic risks, and public confidence in the program will continue to erode.

Recently, the Department of the Interior has begun a review of the Federal Coal Leasing Program. This is an important first step in restoring an environmentally sound and predictable leasing process and priority should be given to its rap-

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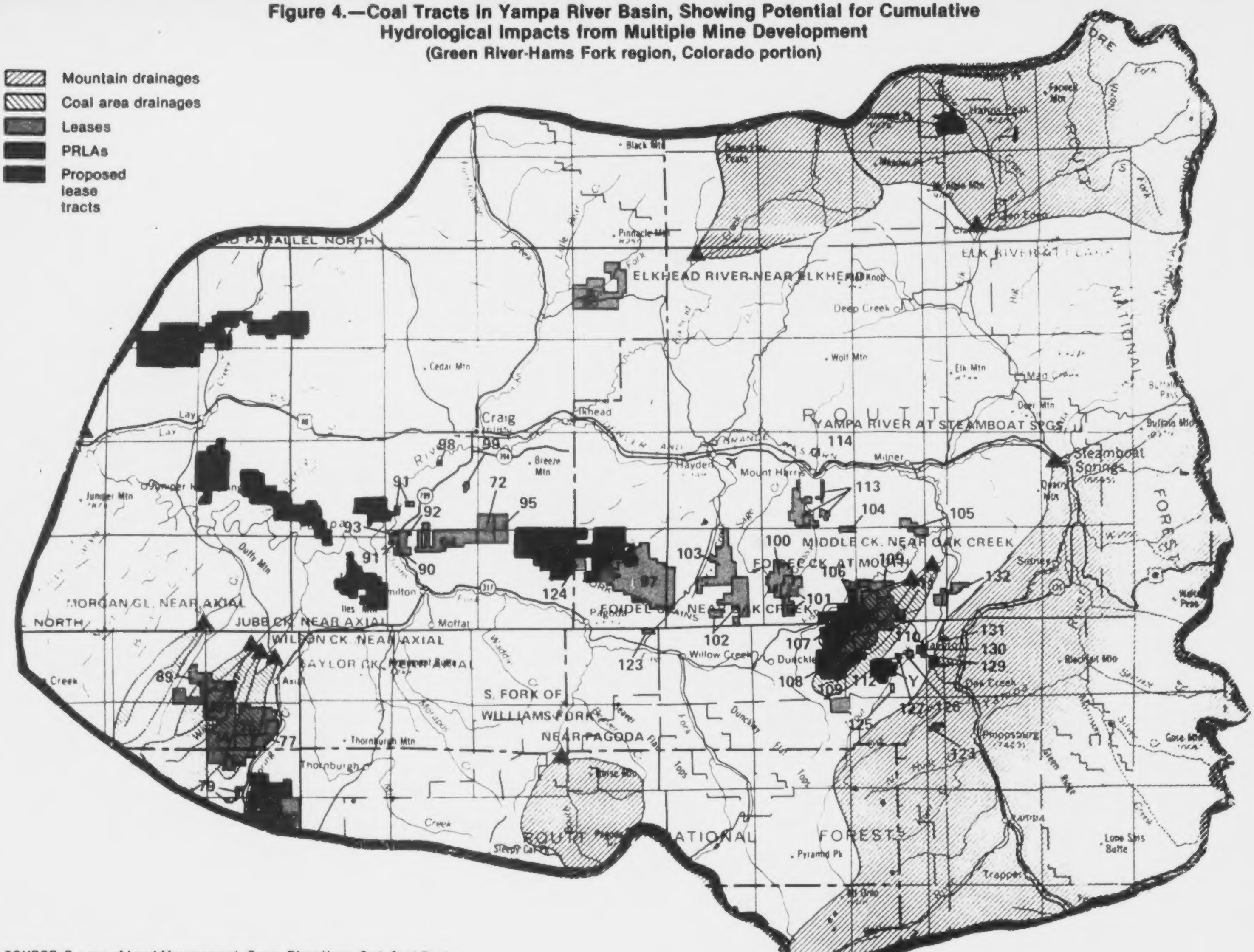
*Cumulative air quality impacts are also a concern with mine-mouth and other coal conversion facilities in Fort Union.

Figure 4.—Coal Tracts in Yampa River Basin, Showing Potential for Cumulative Hydrological Impacts from Multiple Mine Development
(Green River-Hams Fork region, Colorado portion)


▨ Mountain drainages
▨ Coal area drainages
▨ Leases
■ PRLAs
■ Proposed lease tracts
PARALLEL NORTH
ELKHEAD RIVER NEAR ELKHEAD
ELK RIVER AT CLARK
NATIONAL
FOREST
ROUTT
YAMPA RIVER AT STEAMBOAT SPGS.
Steamboat Springs
Craig
Hayden
Milner
Mount Harris
Moffat
MIDDLE CK. NEAR OAK CREEK
FOIDEL CK. AT MOUTH
FOIDEL CK. NEAR OAK CREEK
MORGAN GL. NEAR AXIAL
JUBB CK. NEAR AXIAL
WILSON CK. NEAR AXIAL
TAYLOR CK. NEAR AXIAL
S. FORK OF WILLIAMS FORK NEAR PAGODA
NORTH
Black Mtn
Pinnacle Mtn
Deep Creek
Wolf Mtn
Elk Mtn
Cedar Mtn
Breeze Mtn
Juniper Mtn
Duffy Mtn
Thornburgh Mtn
Thornburgh
Lay
Iles
Hamilton
Pagoda
Axial
Willow Creek
Dunckley
Oak Creek
Yampa
Phippsburg
Pyramid Pk
Lone Spring Butte
Trapper
Hahns Peak
Clark
Buffalo Pass
Gore Mtn
Sleepy Cat Pk
89
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SOURCE: Bureau of Land Management, *Green River Hams-Fork Coal Region Draft Environmental Impact Statement*, Round Two (1983).

id completion. Other actions likely are needed, however, and OTA identified a variety of technical and policy options that could improve the ability of the leasing program to assure the development of leases in an environmentally compatible manner, and help to restore a measure of stability and predictability to the leasing program. These options and the policy goals they might promote are listed in table 4 and discussed below.

OPTION 1: Reduce lease rates

Reducing leasing rates by offering less coal for lease on a predictable, steady schedule (while still allowing for adjustments in that schedule if necessary) would reduce the amount of land that has to be evaluated within a given amount of time for its environmental acceptability for leasing. Thus DOI staff would be more likely to have sufficient time to complete each stage of planning and analysis before proceeding to the next stage. Reduced leasing rates through lower leasing levels also would relieve the pressure on BLM to find a greater number of tracts environmentally compatible, and could address criticisms of the adequacy of pre-sale data and analyses and their documentation, the deferral of planning decisions, and the overuse of detailed lease stipulations. As a result of all these factors, the risk of adverse environmental impacts on lease tracts would be reduced. However, if a lower leasing rate results in BLM concentrating its leasing efforts primarily on those tracts in which industry has expressed strong interest, then such a rate could lead to leasing of tracts that are less environmentally compatible than areas deferred for future evaluation.

A lower, but steady, leasing rate with a predictable schedule also would make planning for all other participants in leasing more efficient. Furthermore, it is important that the process for setting leasing levels be transparent to facilitate public review, and that the process recognize environmental and market realities and public concerns. This option would be easy to implement, but would lengthen the period over which a given level of forecast revenues from the leasing program would be received.

OPTION 2: Decentralize decisionmaking authority

Decisionmaking authority in the current leasing program is highly centralized, with BLM State and field offices, and Regional Coal Teams (RCTs) forwarding recommendations to the Secretary of the Interior, who makes final leasing decisions. The program originally was structured to assure sensitivity to regional, State, and local needs and priorities. However, confidence in the soundness of that structure has eroded as Secretarial decisions on tonnages and tracts to be offered for lease and on the timing of leasing activities (including planning and environmental analysis) have, in many instances, overridden recommendations based on those needs and priorities. Overruling such recommendations also undermines the predictability and stability of the leasing program and thus strains the resources of **all** participants in the program. Several options might be considered to restore the needed sensitivity and predictability.

Decentralizing decisionmaking authority on tracts and tonnages to be offered for lease, and the timing of such offerings, to the RCT or BLM State Office level (subject to Secretarial review) would improve the sensitivity of leasing decisions to State and local needs and priorities. Delegation of final leasing decisions on leasing rates and tracts to be offered to the RCTs or the BLM State Office (subject to departmental review) would have few administrative costs. In effect, leasing decisions would remain in the hands of the Federal Government (which has a majority on each RCT), but the final decision would be closer to the region it affects.

A second option—to **restructure the RCTs to give the States equal or majority representation**—would take decentralization one step further. Under the current RCT structure, the Federal Government retains the majority voting membership on each RCT (see ch. 4). This has contributed further to the perceived insensitivity to State needs and priorities. However, to give the States a greater proportion would delegate important Federal management decisions on

Table 4.—Summary of Policy Goals and Options

Policy options	Reduce environmental risk	Increase effectiveness of public participation	Increase effectiveness of BLM procedures	Improve program predictability and stability	Increase confidence in the soundness of the program	Improve quality of data and analyses to support leasing	Improve sensitivity to State/local needs
1. Reduce lease rates	L	C	C	L	L	L	C
2a. Delegate decisions to RCTs or BLM State Directors	—	—	L	C	L	—	L
2b. Give States equal or majority representation on RCTs	—	—	—	—	—	—	L
2c. Reorganize leasing regions along State boundaries	—	L	L	—	—	C	L
3a. Increase public understanding of the leasing program	—	L	L	C	C	—	C
3b. Improve documentation of planning and leasing decisions	C	L	C	L	C	L	—
3c. Reinstate opportunities for public participation	C	L	—	L	L	C	L
3d. Increase use of RCT task groups and ex officio memberships	C	L	C	C	L	L	L
3e. Expand voting membership on RCTs	—	L	—	—	L	—	L
4. Accelerate the preparation of Resource Management Plans	L	C	L	L	L	L	—
5a. Develop a comprehensive, accessible data base	L	L	L	—	C	L	—
5b. Facilitate use of industry data to support planning and analysis	C	—	C	—	C	L	—
5c. Continue research on mitigation and reclamation	L	—	—	L	—	L	—
6. Provide guidelines and standards for data adequacy	L	L	L	L	L	L	—
7. Reinstate workable threshold concept for cumulative impacts pre-EIS	L	C	C	C	L	L	—
8. Establish policies/procedures for environmental lease exchanges	L	L	L	L	C	—	C
9. Evaluate leasing on split estate and checkerboard lands	L	—	C	L	—	C	C
10. Evaluate policies for environmental analysis of PRLAs	L	L	L	L	C	—	C

KEY: "L" means that an option is *likely* to further the goal; "C" means that the option *could* further the goal.

SOURCE: Office of Technology Assessment.

publicly owned resources to the affected State governments, and may be at least illegal and perhaps unconstitutional.

A third, and also controversial, option for decentralizing decisionmaking would be to **expand voting membership on the RCTs to include a broader range of interests.** This might involve merely adding other affected Federal surface management agencies (e.g., the Forest Service), or all "interested parties" could be considered for membership, which would lead to extensive debate on representation. Alternatively, RCT Task Forces on special topics can be used to ensure greater participation by interested parties (see discussion of public participation, below).

An additional means of decentralization would be to **reorganize the leasing regions along State boundaries.** The current regions correspond to the coal fields, which straddle those boundaries and thus each region contains portions of two States (see fig. 1 in ch. 1). When those States' development policies and goals conflict, leasing decisions can compound the appearance of insensitivity. Using two-State regions in the leasing program also has complicated the coordination of BLM field operations. **Restructuring the leasing regions along State boundaries could make BLM management of the leasing program easier as well as more effective and predictable, because fewer offices would be involved in the planning and analysis for each coal region.** However, it would require reorganization of the roles and responsibilities of the BLM offices involved in the leasing program, and could lead to balkanization of interests.

OPTION 3: Improve the effectiveness of public participation

The effectiveness of public participation could be improved through brochures, newsletters, and workshops aimed at increasing public understanding; through better documentation of planning and leasing decisions; through reinstatement of opportunities for public hearings and comment periods on regional leasing levels, community impacts, and the application of the unsuitability criteria—topics on which public input has proven valuable in the past; and/or through working groups or ex officio memberships within the RCTs.

A basic problem with public participation in the leasing program is that the general public does not understand the program well enough to participate effectively. This problem was dealt with effectively in the Fort Union region with a newsletter issued by BLM and distributed to all interested parties (e.g., landowners, public interest groups, other Federal and State agencies). Techniques that have contributed to public understanding in other government programs include brochures and workshops. **A readable newsletter or brochure** that described the basic steps in the program, their goals and products, and the means of public participation at each step would improve public understanding. Other programs have had success with brochures drafted by Task Forces or Committees composed of representatives of different interest groups as well as the Federal Government. Clearly, either a newsletter or brochure would have to be disseminated widely in areas affected by leasing in order to be effective. **Workshops in local communities** at the outset of land use and activity planning also could improve public understanding, especially if they followed distribution of a newsletter or brochure.

Even groups who understand the leasing process may be frustrated in attempts to participate, however, because of the lack of documentation of leasing decisions. Currently, the availability of documentation varies widely among regions. In at least one region, the basic planning document—the MFP—is not available to the public in published form. In other regions, documents may be widely available, but do not indicate the basis or rationale for decisions. As discussed in chapter 4, regulations requiring such documentation have been dropped. **If all documents supporting decisions were published and widely available, and described the basis for decisions, including supporting technical data and analyses, the *effectiveness* of public participation would be enhanced, and major sources of frustration with—and thus challenges to—leasing decisions would be removed.**

Several other means are available for increasing the quality and quantity of opportunities for public participation. The 1982 revisions to the leasing program regulations eliminated four opportunities for public participation, including hearings on DOE-established production goals, and comment periods on leasing levels, on community impacts, and on the application of the unsuitability criteria. Comments on these factors are now limited to time set aside at public RCT meetings and to personal communications with BLM personnel. **The deletion of these opportunities has reduced the ability of the public to provide an in-depth review of critical decisions supporting a lease sale. Furthermore, these changes may have contributed to public confusion about opportunities for participation. BLM should consider reinstating these opportunities in a manner that would enhance the effectiveness of public participation.**

The RCTs also were intended to provide a forum for public participation in the leasing program. However, for a variety of reasons, including the formal RCT meeting style and inadequate public access to RCT background materials (including time for evaluation), **opportunities for public participation at RCT meetings currently are more procedural than substantive.** As a result, several groups have asked for **voting** membership on RCTs (which was denied). Expanding voting membership to include other affected groups (e.g., Indian Tribes, the Forest Service, local communities and landowners) would be difficult due to the need to decide what the important affected interests are and to negotiate for representation of those interests.

Alternatively, **greater use could be made of special RCT Task Forces or working groups similar to those used by the San Juan River RCT and in Utah, or of ex officio memberships as in Colorado. These avenues for increased public participation have proven effective in promoting constructive dialog among the parties and thus improving the quality of leasing decisions.** The primary obstacles to the more widespread use of RCT task groups, etc., are the limited RCT budget and staff support, and the lack of BLM career incentives for Bureau personnel who serve as RCT staff.

Relative to public participation, **care must be taken to ensure that the environmental, cultural, and economic concerns of special interest groups (including Indian Tribes, local communities, and farmers and ranchers) are addressed adequately.** In particular, consultation with the Tribes has not always occurred early enough in the planning for a lease sale; coordination with Tribal goals and policies is lacking. Such coordination is difficult—in part because the environmental impacts of concern to the Tribes usually do not occur on BLM lands.

These options for improving the effectiveness of public participation tend to have a relatively low administrative cost, with the possible exception of RCT working groups. However, **the benefits posed by effective public participation, in terms of higher quality leasing decisions and therefore reduced environmental risk in, and greater public confidence in the soundness of, the leasing program, would outweigh the costs of implementation.** Negotiated lease stipulations (when stipulations are absolutely necessary) are an additional mechanism for public participation, but, as discussed in chapter 4, raise concerns about the overuse of stipulations and about anticompetitive effects if all potential bidders are not involved in the negotiations.

OPTION 4: Ensure comprehensive area planning is completed before a lease offering

One concern with the current implementation of the leasing program is the continued reliance on Management Framework Plans (MFPs) that have been amended or updated to support recent leasing activity (see ch. 3). **Further delays in the preparation of Resource Management Plans as an up-to-date comprehensive areal planning base will continue to contribute to the perceived inadequacy of BLM's data and analyses, and thus reduce the likelihood that the leasing program will proceed in a predictable and stable manner.** Preparing RMPs is a time-consuming process and could interfere with the immediate progress of leasing unless coupled with a very conservative leasing rate (option 1, above), and may leave BLM open to a charge of "planning for planning's sake" in areas where updated MFPs are legally adequate. However, completion of RMPs as the base for future land use and leasing decisions would remove a major source of criticism of the adequacy of pre-sale planning and analysis, and would help to ensure that pre-sale planning is compatible with the spirit of the 1976 statutory mandate.

As discussed in chapter 4, during fiscal year 1984 BLM proposed to implement several changes in the focus of pre-sale planning and assessment activities in order to reduce the costs of program administration. Of particular concern are the projected shift in emphasis from the collection of areawide data to information specific to areas with a high coal development potential, and the proposal to increase reliance on inhouse and company data (without ensuring public access and review of those data; see option 5, below). These changes assume that the existing planning base will be adequate, with region- or tract-specific amendments, to support future lease sales. Since OTA found the opposite, continued cutbacks in these activities could exacerbate the current problems with the leasing program unless compensating reductions are made in the regional lease rates (option 1, above).

OPTION 5: Develop a means of improving the data base and access to it

Ultimately, the adequacy of land use and activity planning and environmental assessment depends on the quality and quantity of supporting data and analyses. In the course of this study, OTA identified several sources of relevant data that would support leasing decisions by improving BLM's data base, but are not consistently being sought out or systematically used by BLM. These include data from mine plans, ongoing mining operations, other Federal and State agencies, local communities and residents, academe, the industry, and interest groups.

The primary obstacle to the use of these data sources is that they are not compiled in a manner that permits easy access. Thus, BLM staff must not only discover whether information relevant to a particular tract or question exists, but must expend a substantial amount of effort in searching files, mine plans, or the published literature to locate specific data. While consultation with the groups or individuals knowledgeable about an area can facilitate this process somewhat, a comprehensive data base that compiles information from all sources in an accessible manner would provide a systematic means of incorporating the widest possible range of information about an area into pre-sale planning and analyses. Such a data base also could contribute to public and interagency review of BLM documents, as well as to the preparation of mining and reclamation plans. Furthermore, it would help ease the loss of institutional memory that results from attrition and personnel rotations.

DOI currently is developing a computerized data base on Federal coal resources and characteristics. This effort eventually could be expanded to include data bases on other resources, or even research on all aspects of coal development. Alternatively, the task could be funded jointly by Federal and State governments and the industry through an industry association, a consulting group, or a university. OTA notes with regret the discontinuation (for budget reasons) of the Forest Service's quarterly compendium of surface mining research, "SEAM."

At the same time, **BLM needs to maintain up-to-date inventories of all resources on the public domain in order to address concerns about the age of some existing data, and about the gaps in available inventories.** If such inventorying is too expensive for the Federal Government, the burden for collecting these data could be shifted to the industry. One option would be for those companies interested in bidding on tracts within a particular area to jointly fund the collection and analysis of data to support leasing (including data on coal as well as environmental and other resources). The company that submitted the winning bid on a tract could then reimburse the others for their contribution. A similar approach is used in assessing oil and gas resources on the outer continental shelf (30 CFR 251.6-3). Alternatively, an industry-funded research institute could be established (similar in concept to the Electric Power Research Institute), with each company's contribution determined according to considerations such as its size and level of mining activities on Federal lands. For application to coal leasing, either scheme could require some adjustment in the antitrust laws. Moreover, the industry would have to make a commitment that no such data would be deemed proprietary (other than coal resource data)—and thus not subject to public review and comment—in order to address concerns about the injection of an inherently pro-mining bias into BLM's planning and assessment.

Research on the ability to mitigate certain types of impacts and to reclaim surface mined lands also should be continued, and the results disseminated as widely as possible. Knowledge about (and thus use of) mitigation and reclamation techniques varied widely among the five Western coal regions. As a result, some regions used more stringent mitigation requirements than others. This contributed to the perception that pre-sale planning and analyses were inadequate, and may have made mining on some tracts appear more expensive than it had to be.

Finally, an important means of improving the quality of data and analyses is to encourage retention of qualified, experienced field personnel. **Reevaluating incentives for career development to encourage the maintenance of an "institutional memory" in BLM field offices and RCT staff assignments is a crucial first step here.**

OPTION 6: Provide meaningful guidelines and standards for assessing the adequacy of the data base

Workable regulatory standards or guidelines for assessing the adequacy of pre-sale data and analyses would remove some of the grounds for uncertainty about their adequacy, and would aid BLM staff in their management of lease sales. Such standards and guidelines contributed to the consensus on the environmental soundness of the 1979 program regulations, but largely were eliminated from the regulations in 1982. The regulatory standard that remains is too vague to provide meaningful guidance to BLM field personnel, and may even excuse data inadequacy and the deferral of decisions when these can be attributed to time and resource constraints.

Although internal BLM memoranda and other directives continue to provide some guidelines for the adequacy of data and planning, these documents are not binding as regulations are, are not subject to public review and comment, are not as accessible to the public as standards developed through formal rulemaking, and can be changed more easily than regulations. Any regulations developed should not be "cookbook" standards but guidelines with sufficient flexibility to accommodate regional differences in data needs. **These standards should explicitly recognize the quality and quantity of data and analysis in the various field disciplines needed to support decisions at each stage of the leasing process, and also might include guidelines that more rigorously define the circumstances under which decisions can be deferred due to insufficient data** (or for other reasons).

OPTION 7: Incorporate cumulative impact assessments in pre-sale planning decisions

The use of cumulative impact analyses in early land use and activity planning decisions also was part of the consensus on the 1979 regulations. Under the 1982 leasing program, however, cumulative impacts of the development of several mines within an area are not **required** to be assessed until the EIS on a regional lease sale. As a result, such an assessment usually is not incorporated in land use planning decisions, and is not used in activity planning until the RCT's final recommendation on tracts to be offered for lease. Completion of adequate RMPs, which incorporate an EIS on general land use planning decisions, will ease this situation. However, given the tiered concept of data and analysis, the EIS on an RMP cannot include information at the same level of detail as in site-specific analyses or the final EIS on a regional lease sale.

Moreover, the 1982 regulations eliminated the threshold concept of cumulative impacts as a basis for dropping areas from further consideration for leasing prior to the final RCT recommendation. According to DOI, the threshold concept was not well understood and had never been used. **Development of a *workable* threshold concept of cumulative impacts and its reinstatement for land use and pre-EIS activity planning through formal rulemaking would improve the quality of BLM's planning and assessment and reduce the probability that sensitive tracts would be leased.**

OPTION 8: Establish policies and procedures for environmental lease exchanges

OTA found lease exchanges to be a potentially useful tool in reducing the risk that a tract, once leased, would be found to be unminable for environmental reasons. Thus, the availability of environmental exchanges would reduce the pressure to approve a permit application on a tract found to have environmental flaws after it has been leased. Exchanges also can be valuable for pre-1976 leases and Preference Right Lease Applications (PRLAs) that were not acquired under the same mandate for environmental protection and thus might be so environmentally sensitive that the costs of mitigation and reclamation would be prohibitive.

However, **the need for congressional authorization for coal lease exchanges coupled with the lack of established, transparent policies and procedures for effecting environmental lease exchanges prevents their use.** Policies and procedures for economic exchanges are equally in need of evaluation and definition. OTA makes no judgment about the value of economic exchanges, but notes that consolidation of Federal ownership **could** facilitate environmental protection (although this has not always been the case to date).

DOI took a first step toward developing such a policy in a directive issued in November 1983, which states that "the exchange of leasable and salable minerals is an important tool in achieving public interest federal multiple use management and land protection goals," and lists 12 criteria for determining when an exchange would be in the public interest. These criteria include exchanges that would serve a national resource management or protection need. This general policy directive should be supplemented with a detailed outline of the procedures to be followed in evaluating a proposed exchange, which should be subject to public review and comment and incorporated in the program regulations. This would lend predictability and stability to the environmental lease exchange option, improve public and industry understanding of exchanges and thus the effectiveness of public participation, and would reduce the probability (i.e., risk) that environmentally sensitive tracts would be developed.

OPTION 9: Evaluate policies and procedures for leasing on split estate and checkerboard lands

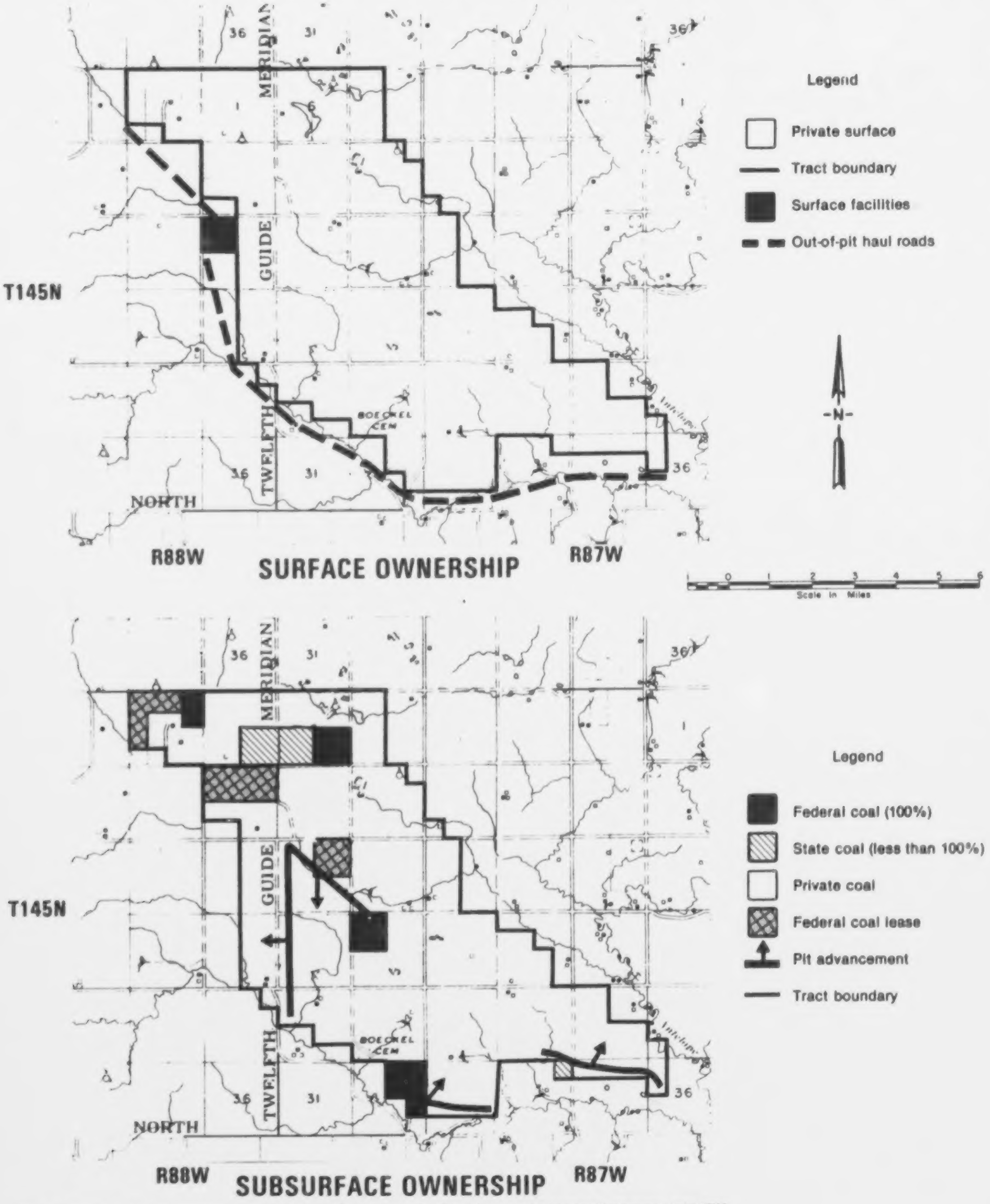
Split estate lands (in which BLM owns the mineral rights but not the surface) and checkerboard lands (where the Federal Government owns every other section in a "checkerboard" pattern) pose the most complex leasing situations. Based on the implementation of the leasing program to date on split estate (and checkerboard) lands, the process does not work the way it was intended in these areas. Resources that should be protected on Federal lands during land use planning do not appear to be valued as highly when they occur on private surface. Surface owners are able to block data collection and leasing entirely, but do not seem to have an equivalent ability to promote decisions in favor of leasing. Moreover, comprehensive areal land use planning and the control of post-mining land uses are extremely difficult in areas where BLM is not the surface manager. These problems are compounded when the Federal Government is the minority landowner. For instance, in the North Dakota portion of the Fort Union Region, the Federal Government owns less than 1 percent of the surface and only up to 13 percent of the mineral estate. Figure 5 illustrates this situation on one potential lease tract in Fort Union.

As a result of these and other concerns, **it is OTA's view that a thorough reexamination of the coal leasing process on split estate lands is merited.** State representation and public participation are essential to the credibility of any program established to evaluate leasing on split estate and checkerboard lands, and one means of performing this evaluation would be through a working group or Task Force of the RCTs in regions where split estate or checkerboard lands raise concerns about the effectiveness of the Federal coal leasing program.

OPTION 10: Establish uniform procedures for environmental evaluation of PRLAs

The environmental evaluation process for PRLAs is subject to many of the same problems identified with land use and activity planning

Figure 5.—Example of Split Estate With Minority Federal Ownership


36
31
36
MERIDIAN
GUIDE
TWELFTH
NORTH
T145N
BOECKEL CEM
36
31
36
R88W
R87W
SURFACE OWNERSHIP
Legend
☐ Private surface
Tract boundary
■ Surface facilities
Out-of-pit haul roads
-N-
0 1 2 3 4 5 6
Scale in Miles
T145N
R88W
R87W
SUBSURFACE OWNERSHIP
Legend
■ Federal coal (100%)
▨ State coal (less than 100%)
☐ Private coal
▩ Federal coal lease
Pit advancement
Tract boundary

SOURCE: Bureau of Land Management, *Fort Union Coal Region Draft Environmental Impact Statement*, July 1982.

for competitive lease sales, but with PRLAs the concerns are more pressing because the PRLA program does not require the formal application of all of the environmental screens that are part of pre-lease planning for competitive lease tracts.* As a result, environmental protection must be achieved largely through mitigation requirements (lease stipulations and permit conditions). In addition, the program regulations were revised in 1982 to eliminate requirements for environmental data and analyses in initial showings for PRLAs. Establishing uniform procedures for environmental evaluation of PRLAs would help improve the quality of such evaluations, ensure consistency among regions (currently lacking), and provide greater predictability to the program.

The relation between the number of PRLAs in a region and the need for new production tracts to meet regional leasing rates also needs to be evaluated. For example, PRLAs in the San Juan River Region are estimated to contain one-half to two-thirds of the surface minable coal. Processing these PRLAs could reduce the need for competitive leasing in that region. Thus, that processing should be included as an alternative to competitive leasing in regional lease sale EISs, as well as be subject to an independent environmental assessment.

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*The unsuitability criteria are applied to PRLAs either during land use planning (if the PRLA can be processed in the normal cycle of land-use planning) or during environmental analysis. If the PRLA is incorporated in land use planning, the multiple-use screen also would be applied.

Chapter 3

The Federal Coal Management Program

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The Federal coal management program was developed in the legislative context of statutes that specifically address the leasing of federally owned coal as well as those related to public land management and environmental protection in general. These include the Federal Coal Leasing Amendments Act of 1976 (FCLAA), the Federal Land Policy and Management Act of 1976 (FLPMA), the Surface Mining Control and Reclamation Act of 1977 (SMCRA), the National Environmental Policy Act of 1969 (NEPA), the Clean Air and Water Acts, and numerous other "environmental" laws.

In 1979, consensus was reached among the participants in the leasing program debate on the elements of an environmentally (and economically) sound program. The Department of the Interior (DOI) incorporated these elements in regulations implementing FCLAA and FLPMA in July and August 1979. In 1982 and 1983, these regulations were revised to reflect a shift in departmental policy toward making more coal available for lease, to eliminate duplicative requirements and those DOI felt were not well understood, and to streamline the process in order to facilitate lease sales. While the basic program structure described below is essentially the same under both the 1979 and 1982 programs, some of the 1982 changes were sufficiently different from the 1979 rules as to severely weaken the earlier consensus.

This chapter describes the legal and regulatory context for planning and environmental assessment in the Federal coal management program. The chapter reviews the applicable statutes and regulations, describes the basic program elements, outlines the major differences between the 1979 and 1982 programs, and analyzes the implications of those differences for the leasing program's ability to assure the development of leases in an environmentally compatible manner. The following chapter discusses specific issues that have arisen about the implementation of the environmental protection aspects of the leasing program, in five Western coal regions (see fig. 1 in ch. 1). While this chapter focuses on **leasing,** it also briefly describes the basic elements of the broader coal management program, especially the surface mine permitting requirements.

THE COAL LEASING PROGRAM

Between 1920 and 1970, Federal coal was leased on demand; i.e., wherever and whenever anyone requested a lease sale or permit. In 1970, a Bureau of Land Management (BLM) study found that although the amount of Federal coal under lease had increased dramatically during the 1960's, production from Federal leases had declined significantly (1). That study ultimately led to a moratorium on further leasing of Federal coal, and DOI began developing an improved long-term coal leasing program (see ch. 1).

Congressional hearings, public debate, and several lawsuits in the 1970's focused on whether Federal coal leases were being held for speculation, and whether enforcement of lease conditions of diligent development and continued operation was effective. Other aspects of the debate surrounding the elements of a new leasing program involved its compatibility with planning for public land management and with environmental laws and regulations (see ch. 1).

These efforts culminated, in 1976, with enactment of the FCLAA and the FLPMA. FCLAA repealed the noncompetitive preference right leasing system (see below) and required that all new leases be issued competitively; provided that no bid can be accepted for less than the fair market value of the lease; facilitated the consolidation of leases into logical mining units for maximum economic recovery; and required diligent development and continuous operation on each lease.

Of particular relevance to environmental protection is section 3(a) of FCLAA, which requires that lands considered for leasing shall have been included in a comprehensive land use plan and that lease sales be compatible with that plan. The comprehensive land use planning procedures developed by DOI to implement section 3(a) of FCLAA are based on the mandates in FLPMA.

In FLPMA, Congress established national policy requiring a multidisciplinary and comprehensive land use planning process that maintains an up-to-date inventory of public land resources, giving priority to the designation and protection of areas of critical environmental concern; projects **all** potential future uses of public lands and resources (not just coal development); and identifies opportunities for the development or conservation of particular resources, considering the relative scarcity of the resource values involved and the availability of alternative means for realization of those values. This land use planning is to be guided by the principles of multiple use of lands and resources, sustained yield of renewable resources, and conservation of depletable resources. In addition, FLPMA requires public land management to protect the quality of scientific, scenic, historical, environmental, air, and water, and archaeological values, including "areas of critical environmental concern"; to preserve certain lands in their natural condition; to provide food and habitat for fish and wildlife and domestic animals; and to provide for outdoor recreation and human occupancy and use (43 USC 1701(a)(8)). Planning activities must be coordinated with those of other Federal, State, and local agencies; and must afford the public adequate opportunity to comment upon the management of public lands.

Based on these general planning mandates, the Federal coal leasing program was structured around an initial comprehensive land use planning process which applies to all Federal lands and all resources on those lands, followed by "activity" planning for the development of federally owned coal resources. Figures 6 and 7 illustrate the leasing process under the 1979 and 1982 programs, respectively. The leasing program applies to new production tracts, bypass tracts (a lease needed to prevent leaving "islands" of unmined coal), and maintenance tracts (needed to continue operations at an existing mine). In addition, some aspects of the program apply to leases issued before 1976 and to leases issued under the noncompetitive preference right leasing system (see below).

A decision to offer a tract for lease is made in the context of a "tiered" system of planning and analysis, in which the level of analytical detail increases over time, while the area being evaluated decreases (see fig. 2 in ch. 2). Thus, early in the process when few data are available, large land areas are classified according to their relative value for development of the full range of resources. Lands that are identified as potentially suitable for coal leasing at this stage are then subjected to increasingly detailed analyses as the lands move closer to actual coal development.

The most detailed analysis prior to mine development occurs **after** a lease has been issued, when the lessee files an application for a surface mining permit, supported by an exhaustive proposed mining and reclamation plan. This final stage in the tiered system reflects the limited Federal agency resources by placing the burden for the most detailed data collection and analysis requirements on the lessee. Environmental protection measures after a mine is opened include inspection and enforcement to ensure that mining and reclamation are in compliance with the permit and approved plan.

Land Use Planning

The principal objective of the land use planning process is to establish a multiple resource use management strategy for each of the "planning units" set up by DOI for the administration of public lands.* This is accomplished through

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*It should be noted that many of the land use planning requirements described below also apply to other agencies who manage Federal lands overlying coal deposits (e.g., the U.S. Forest Service). The land use planning schedules and priorities within these agencies need to be coordinated closely with BLM's planning for lease sales.

Figure 6.—1979 Coal Leasing Program

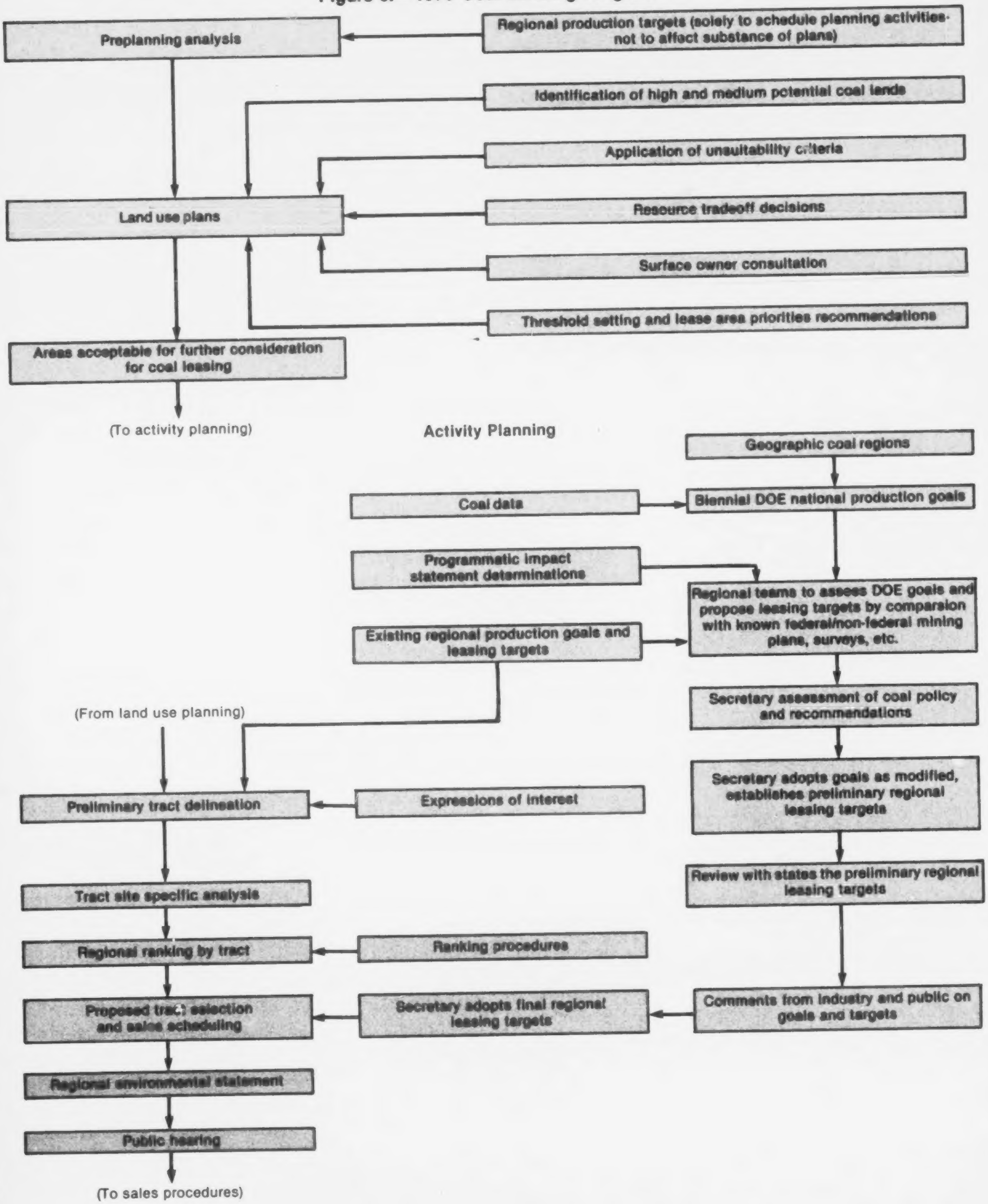
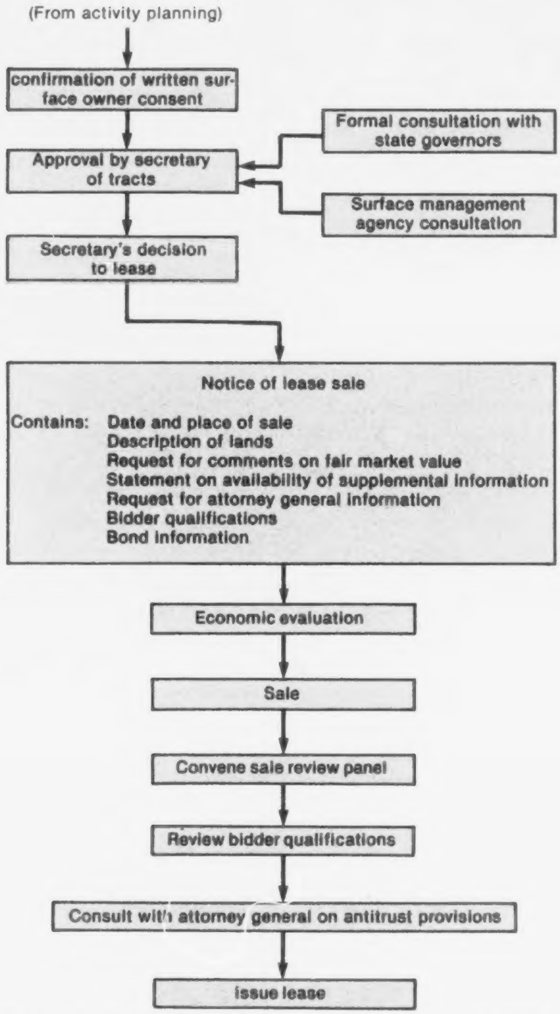

Preplanning analysis
Regional production targets (solely to schedule planning activities-not to affect substance of plans)
Identification of high and medium potential coal lands
Application of unsuitability criteria
Land use plans
Resource tradeoff decisions
Surface owner consultation
Threshold setting and lease area priorities recommendations
Areas acceptable for further consideration for coal leasing
(To activity planning)
Activity Planning
Geographic coal regions
Coal data
Biennial DOE national production goals
Programmatic impact statement determinations
Regional teams to assess DOE goals and propose leasing targets by comparison with known federal/non-federal mining plans, surveys, etc.
Existing regional production goals and leasing targets
Secretary assessment of coal policy and recommendations
(From land use planning)
Secretary adopts goals as modified, establishes preliminary regional leasing targets
Preliminary tract delineation
Expressions of interest
Review with states the preliminary regional leasing targets
Tract site specific analysis
Regional ranking by tract
Ranking procedures
Proposed tract selection and sales scheduling
Secretary adopts final regional leasing targets
Comments from industry and public on goals and targets
Regional environmental statement
Public hearing
(To sales procedures)

Figure 6.—1979 Coal Leasing Program—Continued

Sales Procedures


(From activity planning)
confirmation of written surface owner consent
Formal consultation with state governors
Approval by secretary of tracts
Surface management agency consultation
Secretary's decision to lease
Notice of lease sale
Contains: Date and place of sale
Description of lands
Request for comments on fair market value
Statement on availability of supplemental information
Request for attorney general information
Bidder qualifications
Bond information
Economic evaluation
Sale
Convene sale review panel
Review bidder qualifications
Consult with attorney general on antitrust provisions
Issue lease

SOURCE: Bureau of Land Management, Federal Coal Management Program, Final Environmental Statement, April 1979.

Figure 7.—Current Coal Leasing Process

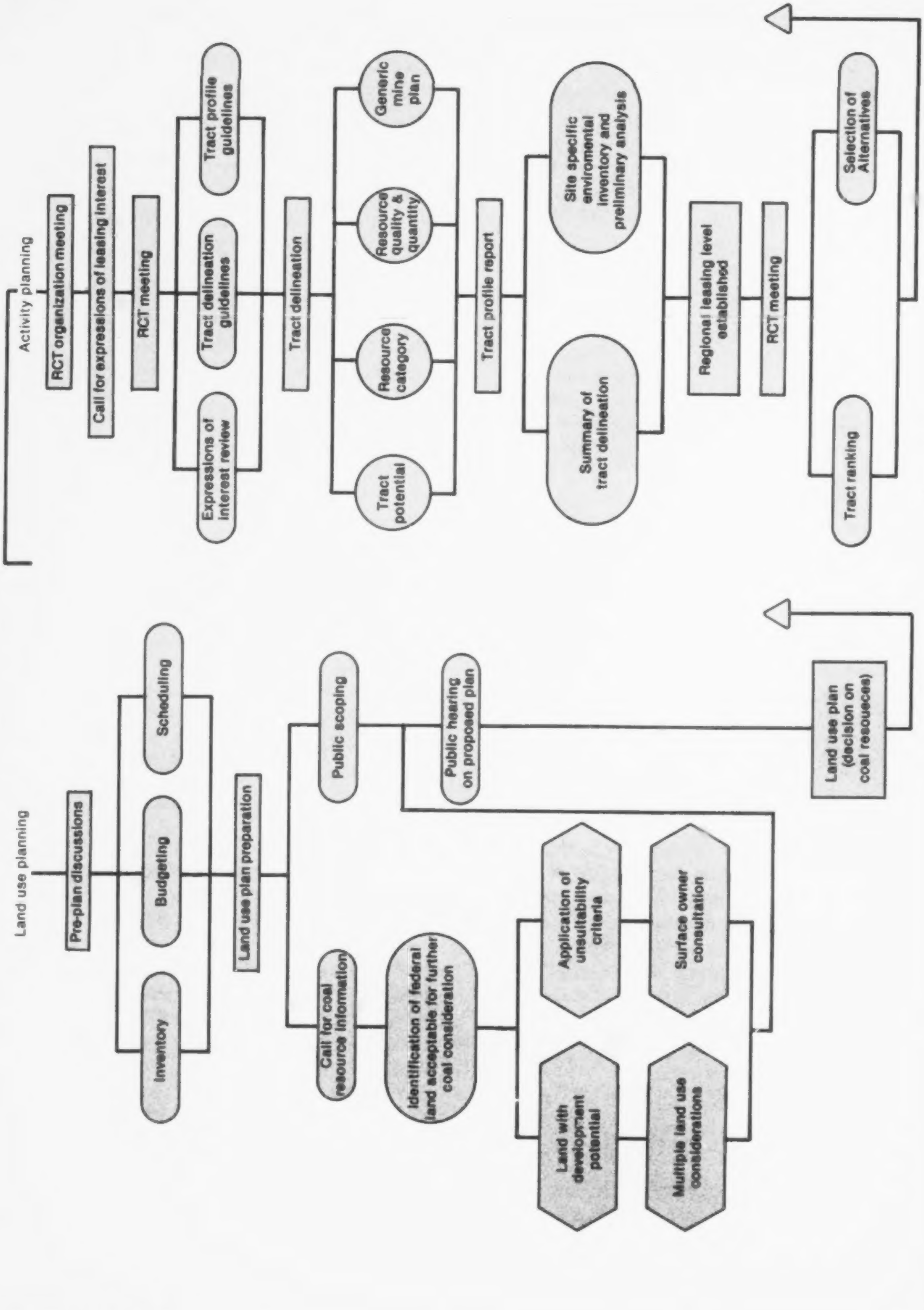

Land use planning
Pre-plan discussions
Inventory
Budgeting
Scheduling
Land use plan preparation
Call for coal resource information
Public scoping
Identification of federal land acceptable for further coal consideration
Public hearing on proposed plan
Land with development potential
Application of unsuitability criteria
Multiple land use considerations
Surface owner consultation
Land use plan (decision on coal resouces)
Activity planning
RCT organization meeting
Call for expressions of leasing interest
RCT meeting
Expressions of interest review
Tract delineation guidelines
Tract profile guidelines
Tract delineation
Tract potential
Resource category
Resource quality & quantity
Generic mine plan
Tract profile report
Summary of tract delineation
Site specific enviromental inventory and preliminary analysis
Regional leasing level established
RCT meeting
Tract ranking
Selection of Alternatives

Figure 7.—Current Coal Leasing Process—Continued

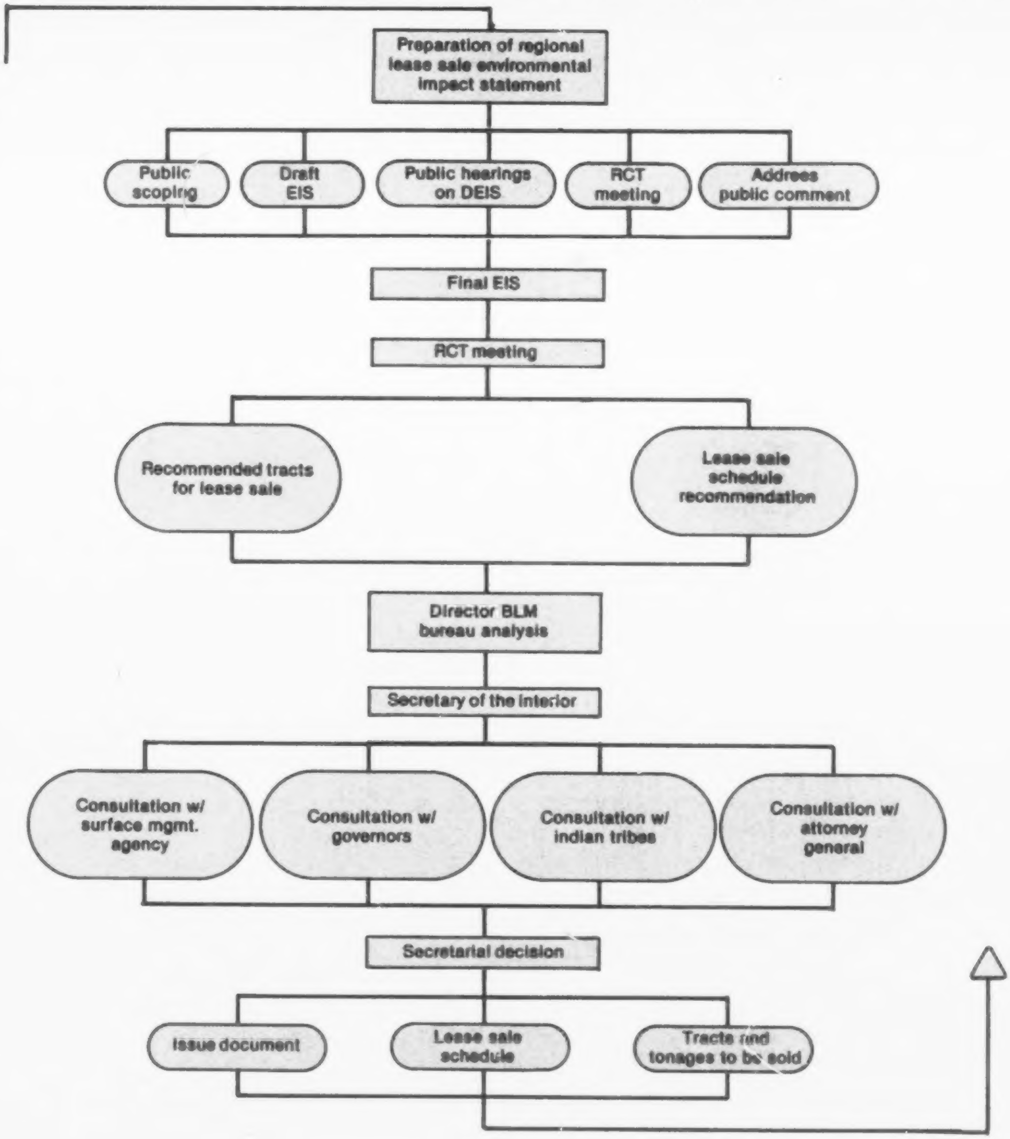
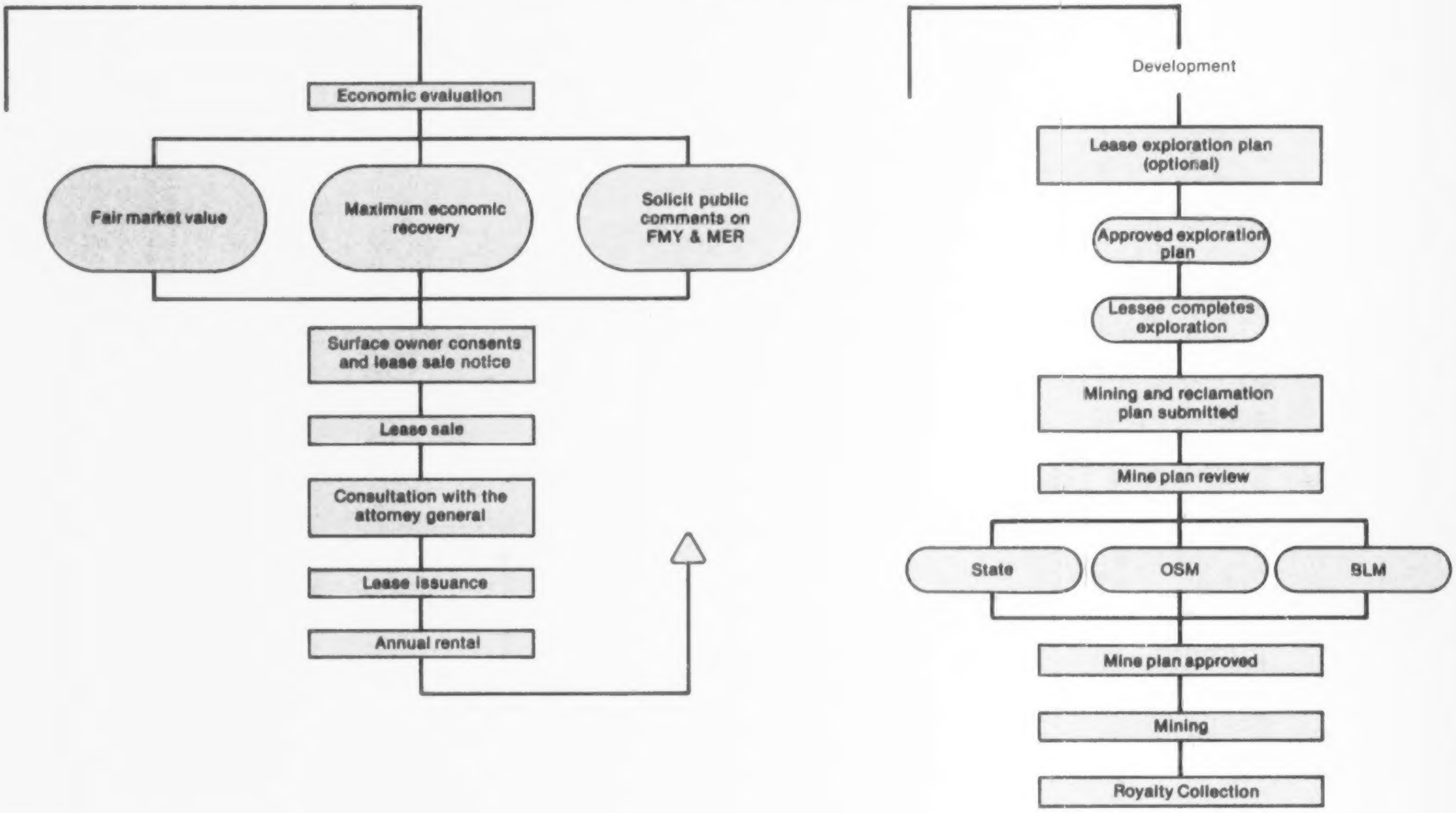

Preparation of regional lease sale environmental impact statement
Public scoping
Draft EIS
Public hearings on DEIS
RCT meeting
Address public comment
Final EIS
RCT meeting
Recommended tracts for lease sale
Lease sale schedule recommendation
Director BLM bureau analysis
Secretary of the Interior
Consultation w/ surface mgmt. agency
Consultation w/ governors
Consultation w/ indian tribes
Consultation w/ attorney general
Secretarial decision
Issue document
Lease sale schedule
Tracts and tonages to be sold

Figure 7.—Current Coal Leasing Process—Continued


Economic evaluation
Fair market value
Maximum economic recovery
Solicit public comments on FMY & MER
Surface owner consents and lease sale notice
Lease sale
Consultation with the attorney general
Lease issuance
Annual rental
Development
Lease exploration plan (optional)
Approved exploration plan
Lessee completes exploration
Mining and reclamation plan submitted
Mine plan review
State
OSM
BLM
Mine plan approved
Mining
Royalty Collection

SOURCE: Bureau of Land Management.

identification of **all** potential land uses and of opportunities for the development of particular resources based on their relative values (see fig. 7). Coal development is one possible land use, and, during land use planning, four screens are used to identify the acceptability of public lands for further consideration for coal leasing. These screens focus on coal development potential, the environmental acceptability of lands for mining, multiple use management, and surface owner preferences about mining (where BLM does not own the surface). Based on the results of the application of these four initial screens, lands determined to be acceptable for further consideration for coal development are carried forward into activity planning for leasing.

Land use planning is preceded by a certain amount of in-house planning by BLM staff, who review basic procedures; identify issues and estimate their relative significance; perform literature searches and organize data available in-house; make initial contacts with other affected agencies and organizations; analyze a range of possible regional coal production targets; etc. Based on these and other tasks, BLM field personnel estimate the time needed to complete land use and activity planning and prepare for a lease sale. The field staff's recommendations on scheduling are reviewed and passed on to the Secretary, who establishes a lease sale target schedule. All BLM personnel and other affected agencies are expected to adhere to this schedule throughout the leasing process (see discussion of "Regional Leasing Rates" in ch. 4).

The coal development screen begins with an announcement to the coal industry, the public, other Federal agencies, State and local governments, and Indian Tribes, calling for information identifying major issues related to resource use and protection within a BLM planning unit. This initial, general call for information is supplemented by a formal solicitation (through a Call for Coal Resource Information) of industry "indications of interest" in leasing coal and industry information on coal resource development potential (43 CFR 3420.1-2(a)). Based on the responses to these requests for information, lands are categorized according to their coal development potential (based on such factors as quality of coal, depth of seam, thickness of overburden, etc.) and lands with no such potential are not considered further for leasing (43 CFR 3420.1-4 (e)(1)).

This screening procedure has been criticized because the 1982 regulations allow lands with a "low" coal development potential to be carried forward along with those having moderate to high potential. Low development potential lands would have been screened out under the 1979 regulations. Including such lands in later analyses expands BLM's workload because more land would then have to be analyzed in subsequent stages of land use and activity planning. Furthermore, if lands with low coal development potential are **leased,** it could result in inefficient mining and increase the risk of adverse environmental impacts in some areas because more surface acres would have to be disturbed per ton of coal extracted. Under other circumstances, however, lands with low development potential could be favorably located with regard to transportation or could be needed to complete a logical mining unit. The inclusion of low coal development potential lands also could promote flexibility to adjust to changing market conditions and mining technologies. Where these factors are present, carrying such lands forward for further analysis seems reasonable.

The acceptability of lands for mining is assessed based on 20 criteria described in the program regulations. Several of these criteria were mandated or suggested in SMCRA, several embody requirements under other Federal statutes which DOI chose to enforce through the unsuitability criteria review process (e.g., the Endangered Species Act), and some DOI selected on the basis of its judgment of their merits. Each of the criteria is applied to all coal lands identified in the land use analysis as having development potential. If one or more criteria are found to apply in a particular area, exceptions and exemptions to the applicable criteria are analyzed to see if they pertain. If they do not, the land either will be considered unsuitable for further consideration for leasing, or other mitigation requirements will be imposed through proposed lease stipulations (see "Mitigation Requirements" in ch. 4).

The 20 unsuitability criteria are:

1. lands in the Federal land preservation system (e.g., National Parks, Wildlife Refuges, Trails, Wild and Scenic Rivers, Recreation Areas, Wilderness Areas);
2. lands within rights-of-way or easements;
3. lands within 100 ft of cemeteries and rights-of-way for public roads, or within 300 ft of public and residential buildings;
4. wilderness study areas, while under review for wilderness designation;
5. Class I scenic areas;
6. lands used for scientific studies involving food or fiber production, natural resources, or technology demonstrations and experiments;
7. publicly owned places on Federal lands which are listed on the National Register of Historic Places;
8. lands designated as natural areas or as National Natural Landmarks;
9. federally designated critical or essential habitat for threatened or endangered plant and animal species;
10. lands containing habitat considered critical or essential for State-designated threatened or endangered plant and animal species;
11. bald or golden eagle nests or sites, including appropriate buffer zones that consider habitat for prey species;
12. bald and golden eagle roost and concentration areas used during migration and wintering;
13. falcon cliff nesting sites and appropriate buffer zones that consider prey species' habitat;
14. high priority habitat for migratory bird species of high Federal interest on a regional or national basis;
15. essential habitat for resident fish and wildlife species of high interest to the State (e.g., active dancing and strutting grounds for sage grouse, sharp-tailed grouse, and prairie chicken; critical winter ranges for deer, antelope, and elk; and migration corridors for elk);
16. lands in riverine, coastal and special flood plains (100-year recurrence);
17. lands committed by the surface management agency to use as municipal watersheds;
18. natural resource waters identified in State water quality management plans and a buffer zone of one-quarter mile from the outer edge of the far banks of the waters;
19. alluvial valley floors (AVFs) considered important for agriculture, or land outside an AVF if mining would materially damage surface or underground water systems that supply the AVF; and
20. lands deemed unsuitable by criteria proposed by a State and adopted by the Secretary of the Interior in rulemaking.

These criteria apply primarily to lands evaluated for leasing for surface mining since 1976 (i.e., after passage of FLPMA and FCLAA), subject to the exemptions and/or exceptions described below. In addition, the unsuitability criteria are applied to preference right lease applications (PRLAs), either during land use planning (if the PRLA is included in a comprehensive land use plan) or during environmental analysis (43 CFR 3430.3-1). The unsuitability criteria also are applied to lands that will be mined by underground methods, but the criteria cannot be used to declare such lands unsuitable for mining unless surface operations and impacts will affect Federal lands to which a criterion pertains (43 CFR 3461.2).

In the 1979 regulations, the criteria also were applied to tracts leased before 1976 but not yet being mined, either as part of the normal land-use planning process or during mine plan review. This requirement was eliminated in the 1982 regulations, and such lands now are reviewed for suitability only under the mandatory suitability provisions of SMCRA (43 CFR 3461.4-2). The Department argues that this change merely eliminated a duplicative set of requirements and is in accord with current policy to interfere as little as possible with "valid existing rights" and to expedite the planning for new lease sales (4). However, the change is being contested in court because the suitability review required under SMCRA for mine plan review may not be as rigorous as under the 20 criteria, possibly resulting in inadequate consideration of the multiple resource use implications of coal development in land use plans (see discussion of "Unsuitability Criteria" in ch. 4).

The unsuitability criteria also are subject to exemptions and/or specific exceptions. General exemptions applicable to several criteria include: lands subject to valid existing rights (criteria #1, #3, #4 (limited)); lands to which the operator made substantial legal and financial commitments prior to January 4, 1977 (all except criteria #3, #4, and #19); surface coal mining operations existing on August 3, 1977 (all except criterion #4 and #7); and lands for which a mining permit has been issued (all but #3, #4, and #7). All criteria except #4, #5, #6, #15, #16 and #19 also are subject to one or more specific exceptions. For example, the exceptions to criterion #11 state that a lease may be issued if stipulations can ensure that eagles are not disturbed during the breeding season, or if the Fish and Wildlife Service determines that the nest(s) can be moved; and the size of a buffer zone can be decreased if active eagle nests will not be affected adversely (see discussion of "Mitigation Requirements" in ch. 4).

In the 1982 regulations, additional exemptions were added to seven of the unsuitability criteria. Furthermore, the general applicability of the exceptions was expanded. The 1979 regulations specified that exceptions should only be considered for areas where there is **only one** unsuitability condition. The 1982 regulations expanded this to areas where **one or more** unsuitability conditions exist (43 CFR 3461.3-1(a)(1)). The combined effect of these expansions is to make it less likely that an area will be excluded from further consideration for leasing based on the unsuitability criteria.

A recent (December 1983) change in criterion #7 also has been the target of much criticism. Criterion #7 formerly applied to **all** sites on Federal lands that were included **or eligible for listing** in the National Register. This criterion is now limited to **publicly owned** sites on Federal lands that **are** listed. Thus, privately owned sites are no longer protected, yet protection of such sites was one rationale for establishing the National Register.

It should be noted that neither the 1979 nor the 1982 regulations include an unsuitability criterion based on the reclaimability of coal-bearing lands. Such a criterion was considered early in the development of the 1979 leasing program, but was dropped because there is an affirmative legal burden (under SMCRA; 30 U.S.C. 1260(b)(2))) on an applicant for a mining and reclamation permit to demonstrate that reclamation is technologically and economically feasible, (2). Thus, the regulations implementing the leasing program assume that this requirement will be met during review of the permit application by the Office of Surface Mining or the State permitting agency (see ch. 4).

The multiple resource use screen is intended to eliminate lands from further consideration for coal leasing if other resources on those lands are determined by BLM to be locally important or unique. In general, a multiple-use tradeoff is appropriate when one land use (e.g., mining) would absolutely preclude other valuable resource uses which are not covered by the 20 unsuitability criteria (43 CFR 3420.1-4(e)(3)). BLM only infrequently uses the multiple-use screen to eliminate lands from further consideration for leasing. According to the Bureau, this is because lands that might be subject to a multiple-use tradeoff usually already will have been eliminated for other reasons (e.g., determination of no coal potential, application of an unsuitability criterion) (4). However, where multiple-use tradeoffs might be appropriate, critics of the leasing program contend that BLM generally tends to assign coal development a higher priority than competing land/resource uses.

The surface owner preference screen requires that coal resources underlying privately owned surface not be considered for surface mining if a significant number of the surface owners object to leasing during the initial consultation with BLM. If underground mining is technically or economically infeasible, the land could still be considered for leasing, but it must be assigned a low priority in ranking compared to lands without surface owner conflicts (43 CFR 3420.1-4(e)(4)). Final surface owner consents are not obtained until the end of activity planning.

Two additional concerns have arisen about the current land use planning process: the timing of the application of the four screening procedures, and the elimination of a discretionary fifth screening procedure based on a "threshold" analysis of cumulative impacts (compare the land use planning portions of figs. 6 and 7). The 1979 regulations specified that the four screens be applied **sequentially,** in the order listed above. Sequential application of the screens was consistent with the concept of a tiered system of analyzing lands, in which increasingly stringent environmental tests would be applied at each step of the leasing process. The 1982 regulations allow these four screening procedures to be applied **simultaneously.** Although the screens still are applied, there is concern that scarce BLM time and staff resources will be diluted evaluating (for example) surface owner preferences over a larger land area than might have been necessary if the other three screens had been applied first and in sequence.

The 1979 regulations also included a fifth, discretionary, screen that employed critical threshold levels of cumulative impacts from the development of more than one mine within an area. If threshold levels were set, and if it was determined during land use planning that mining on all potential tracts would mean that such a level would be reached, BLM was **required** to halt, suspend, or condition further consideration of the affected area for leasing. This screen was dropped in the 1982 regulations because it had never been used (4). The BLM District Managers may still include critical threshold levels as one factor to be considered in the formulation of the land use alternatives that will be analyzed during land use planning (43 CFR 1601.5-4(a)(9)). However, threshold levels of cumulative impacts relative to coal development are not required to be considered until the lease sale EIS is prepared (see below).

The threshold concept had long been a source of confusion and had "not proven practical for land use managers" (4). The threshold concept could be a valuable tool in both land use planning and tract ranking if it were reinstated in the regulations for these stages of planning and assessment. In doing so, BLM should make every effort to understand the concept and how it could be expressed in regulations in a workable and enforceable manner. Issues related to threshold analyses are discussed further in the "Data and Analysis" section of chapter 4.

The product of land use planning under FLPMA is a document called a "resource management plan" (RMP), which is to be distinguished from the "management framework plans" (MFPs) developed before enactment of FCLAA and FLPMA. RMPs are required, under FCLAA/FLPMA, to identify and protect Areas of Critical Environmental Concern (ACECs); include sufficient opportunities for public participation; incorporate the inventorying of public land resources; evaluate resources from local, regional and national perspectives; identify conflicts in resource values and uses; and develop and analyze alternative land/resource use proposals that resolve conflicts through decisions on multiple-use tradeoffs. To fulfill the latter requirement, in particular, RMPs include a full EIS on resource management alternatives, and the NEPA process thus is built into land use planning decisions from the start, rather than coming only at the end of activity planning (the second stage in the leasing process) (43 CFR 1601.7-3).

Preparation of new comprehensive RMPs is a lengthy process, and a key issue raised by the leasing program is the continued reliance on amended MFPs, as a basis for land use and activity planning for coal leasing while new RMPs are developed. Due to DOI's concerns about the old MFPs' compliance with FCLAA/FLPMA and their ability to support planning to match current and anticipated resource demands, the 1979 regulations set a deadline of December 31, 1984, on the use of old MFPs in land use planning for new Federal coal lease sales (43 Fed.Reg. 58764). Prior to that date, those regulations allowed leasing based on an MFP only if it had been amended or updated to comply with the land use planning standards established in FCLAA/FLPMA.

The deadline for the completion of new RMPs as comprehensive land use plans to guide leasing decisions was eliminated in the 1982 regulations, due to BLM's need to allocate time, staff, and funds to implementing the leasing program.

BLM currently is working on RMPs in some planning areas, but RMPs for coal leasing areas were not completed in time to support first round lease sales, and may not be available to support the planning for sales that will occur within the next couple of years, even though the legislation mandating their preparation was approved over 7 years ago.

Moreover, as discussed in chapter 4, detailed regulatory guidelines for judging the acceptability of an amended or updated MFP for new competitive leasing (including those requirements listed above) were deleted and replaced with a general policy statement that BLM could continue to rely on amended or updated MFPs as long as they are "in compliance with the principle of multiple use and sustained yield and shall have been developed with public participation and governmental coordination, but not necessarily precisely as prescribed by §§ 1601.3 and 1601.4 of [43 CFR]" (43 CFR 1601.8(b)(1)). According to DOI this change was part of the overall effort to eliminate duplicative regulatory requirements and reduce administrative costs (4). However, this change in the program also contributed to public uncertainty about the program's ability to ensure environmental compatibility.

Several studies, including a 1981 General Accounting Office report, entitled *Minerals Management at the Department of Interior Needs Coordination and Organization,* have found many MFPs to be deficient with regard to compliance with current land use planning laws. An exhaustive analysis of the **legal** adequacy of updated and amended MFPs to support planning for coal leasing was beyond the scope of this project. However, regardless of whether updating or amending MFPs brings them within the specific regulatory requirements, it is OTA's judgment that such amended plans cannot provide the sort of comprehensive "fresh-start" planning envisioned by the legislation, especially **areawide resource management** planning based on the evaluation of alternatives in an EIS (as opposed to the current program, in which an EIS is prepared only during activity planning). On the other hand, where updated or amended MFPs are legally adequate, replacing them with RMPs would leave BLM open to charges of "planning for planning's sake"—something the Bureau frequently has been accused of in the past.

Activity Planning and Lease Sales

After general resource planning for a management area is complete, subsequent planning focuses on a specific activity—in this case coal leasing. Like land use planning, activity planning is predicated on a tiered system of increasingly detailed reviews of smaller and smaller groups of tracts. As shown in figure 7, activity planning for a region culminates in a Secretarial decision on the tracts and tonnages to be offered for lease and the schedule for lease sales in that region.

Information from land use planning about areas' acceptability for mining, plus formal industry expressions of interest in particular areas, are used to develop initial draft leasing levels and to delineate tracts. States and the public also may suggest coal land they deem particularly acceptable or unsuitable for leasing. When proposed tracts have been delineated, BLM field staff conduct a site-specific analysis (SSA) of the full range of environmental, social, economic, and other resource values on each tract. The SSAs provide the basis for detailed tract profiles, which are used to select combinations of tracts for analysis in the EIS (see below). DOI may establish the final regional leasing level at any time after the call for industry expressions of interest but before the selection of EIS alternatives (43 CFR 3420.3 et seq.).

The SSA generates the greatest level of detail of information about a tract available to DOI before a lease sale. According to the programmatic EIS for leasing, "the information . . . must be sufficiently detailed so that the Department would be reasonably certain that the lease would be economically and environmentally acceptable, but in less detail than would be required of a lessee at the time a mining plan would be approved" (2). For example, the hydrologic analysis in a tract profile could be based on field sampling pursuant to a scaled indexing system; the cultural resource assessment could incorporate a comprehensive literature search for known resources (or a 10 to 25 percent field survey in areas about which no data are available). In practice, however, time, staff, and budget constraints have meant that these levels of data have not always been achieved on tracts analyzed for recent lease sales (see discussion of "Data and Analysis" in ch. 4).

Following preparation of the tract profiles, the Regional Coal Team (RCT)* ranks tracts according to their acceptability for leasing after considering factors such as coal economics, impacts on the natural environment, and socioeconomic impacts (43 CFR 3420.3-4). Tract rankings and SSAs do not necessarily affect tract delineation, although tract boundaries can be adjusted as the results of SSAs or tract rankings, or tracts may be dropped altogether at this stage.

The RCT uses these rankings to select at least one combination of tracts that approximates the regional leasing level, plus tract combinations representing alternative leasing levels. These must include a "preferred alternative" that optimizes the economic and resource benefits of leasing and minimizes the social and environmental costs. The RCT may adjust the tract ranking and select tracts to reflect a variety of considerations, including the compatibility of coal quality, coal type, and market needs (including industry expressions of interest); environmental and socioeconomic impacts; the compatibility of reserve size and demand distribution for tracts; public opinion; avoidance of future emergency lease situations; and special leasing opportunity requirements (43 CFR 3420.3-4(b)(2)). (Although the revised leasing regulations only require the RCT to select one combination of tracts that meets the regional leasing level, NEPA mandates the consideration of alternatives to a proposed action, and, in practice, the RCTs usually select several combinations of tracts.) As discussed in chapter 4, some opportunities for public and interest group participation are afforded throughout tract ranking, the selection of alternatives, and the development of leasing levels.

The environmental impacts of the leasing alternatives, including the preferred alternative, are then assessed in detail in an EIS (see discussion of environmental protection, below). A draft EIS is published, and after public comment and interagency review, is revised and issued as a final EIS. As a part of the tiered system, the data and analyses needed to prepare the EIS expand on the information in the SSAs and tract profiles, but focus on particular combinations of tracts. Lease stipulations to protect environmentally sensitive areas may be proposed in the EIS (see "Mitigation Requirements" in ch. 4).

Following publication of the final EIS, written surface owner consent is confirmed, and the Secretary begins formal consultations with the affected State Governors and the surface management agency prior to approving a combination of tracts and tonnages to meet a regional leasing level and establishing final dates for maintenance, bypass, and new production tract lease sales. Then DOI issues a notice of lease sale, performs the economic evaluation, and holds the sale.

The major issues posed by the activity planning for recent lease sales are the lease sale rates—or the ratio of regional leasing levels and lease sale schedules—and the ability of the tract rankings and selection of alternatives to reflect data inadequacies and cumulative impacts. These issues are discussed in detail in chapter 4.

Post-Leasing

After a lease is issued, but before coal mining may begin, lessees must submit a detailed permit application, including a mining and reclamation plan, either to the State permitting agency (in States with approved programs under SMCRA) or to the Office of Surface Mining, or, where the mine would involve Federal lands, to both. Preparation and review of the mine plan and permit application is the last step in the tiered system of environmental assessment in the Federal coal management program. At this stage, extensive tract-specific data and analyses are provided by the permit applicant and the proposed methods of mining and reclamation, the potential environmental impacts, and the recommended impact mitigation techniques are described in detail. For instance, tract-specific cultural resource analyses in support of a mine plan might be based on a 100 percent inventory in areas where such resources are considered important (e.g., the San Juan River Region). Recommended techniques to mitigate the potential adverse environmental impacts of mining are derived from these extensive data bases and analyses and, if not already covered by lease stipulations, are included in the mine plan or in permit conditions (see "Mitigation Requirements" in ch. 4). If the potential impacts of issuing a permit are considered significantly different from those projected when the lease was issued, an EIS also is supposed to be prepared at this stage.

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*The Regional Coal Team is a DOI/State organization made up of a representative of the Governor from each State in the region and the BLM State Director from each State involved. Each RCT is chaired by a BLM State Director from a nonaffected State (see ch. 4 for a detailed discussion of the role of RCTs).

Once a mine plan and permit application are approved, construction of a coal mine may begin. The permitting agency has the authority to refuse to issue a permit for environmental or other reasons, but in practice, decisions at this stage are intended primarily to accommodate mining, and no tract has ever been denied a permit, although portions of tracts have been excluded from mining, and in a few instances permit applications have had to be submitted more than once before being approved. Following the onset of mine development, compliance with the terms of leases and and permits is monitored through inspection and enforcement programs.

As noted previously, analysis of the adequacy of environmental protection measures after a lease is issued was beyond the scope of this assessment. However, several recent reports have been critical of the ability of permitting and enforcement programs to ensure adequate environmental protection. Such criticism reflects on the adequacy of the leasing program due to the extent to which final decisions on impact mitigation are deferred from the leasing program to the permit stage and beyond (see "Deferral of Decisionmaking" in ch. 4).

PREFERENCE RIGHT LEASE APPLICATIONS

The Mineral Leasing Act of 1920 originally established two leasing mechanisms: competitive bidding for lands **known** to have commercially valuable coal deposits, and preference right leasing for **unexplored** areas. Under the preference right leasing system, exclusive prospecting permits could be converted to leases if commercial quantities of coal were discovered. FCLAA ended the preference right leasing system (except for lease applications and prospecting permits that were in effect on passage of the act) on the basis that it did not grant the public a "fair return" on coal. Most of the preference right lease applications (PRLAs) were not processed during the leasing moratorium of the 1970's. The 1979 and 1982 program regulations set a deadline of December 1984 for their final disposition. Currently, about 133 PRLAs are still pending—many since the late 1960's.

The PRLA system was effective in encouraging exploration of undeveloped Federal coal lands at industry's expense. Prospecting permits allowed the applicant, **at his own expense,** to conduct exploratory drilling to determine if the permitted lands contained "commercial quantities" of coal. Thus, the PRLA system not only enabled the Federal Government to determine the "existence" or "workability" of Federal Western coal deposits, it also served the interests of industry by guaranteeing a lease to a company or prospector who discovered commercial quantities of coal in the permit area. However, as noted above, the system was criticized for not providing a fair return on Federal coal leases and was abolished in 1976, subject to valid existing rights.

Before a PRLA can be converted into a lease, the applicant must first successfully complete an "initial showing" providing basic information about the nature, existence, and environmental setting of coal deposits discovered during the 2- or 4-year period covered by the prospecting permit (43 CFR 3430.2-1). BLM then analyzes the application in detail, and prepares either an environmental assessment (EA) or a full EIS. The second or "final showing" is to demonstrate that the tract contains commercial quantities of recoverable coal. In determining the potential for profitable mining, BLM must consider comprehensive information on estimated revenues and all costs, including those related to compliance with environmental laws, in addition to mining and transportation costs (43 CFR 3430.4). If the standard of commercial quantities (and other requirements of the Mineral Leasing Act) is met, the courts have held, in *NRDC* v. *Berklund,* that a lease **must** be issued (6). The Court added, however, that the costs of meeting environmental protection requirements should be considered when applying the commercial quantities test and that preference right lease issuance procedures must comply fully with NEPA, including the preparation of EAs or EISs.

Under the current DOI program for environmental analysis of PRLAs, they are not necessarily subject to all of the four screens applied to potential competitive leases during land use planning. The unsuitability criteria must be applied to PRLAs either during the normal course of land use planning (if the PRLA can be processed on the same schedule as a comprehensive land use plan) or during environmental analysis. The multiple-use screen only is applied if the PRLA can be processed during the normal cycle of land use planning (43 CFR 3430.3-1).

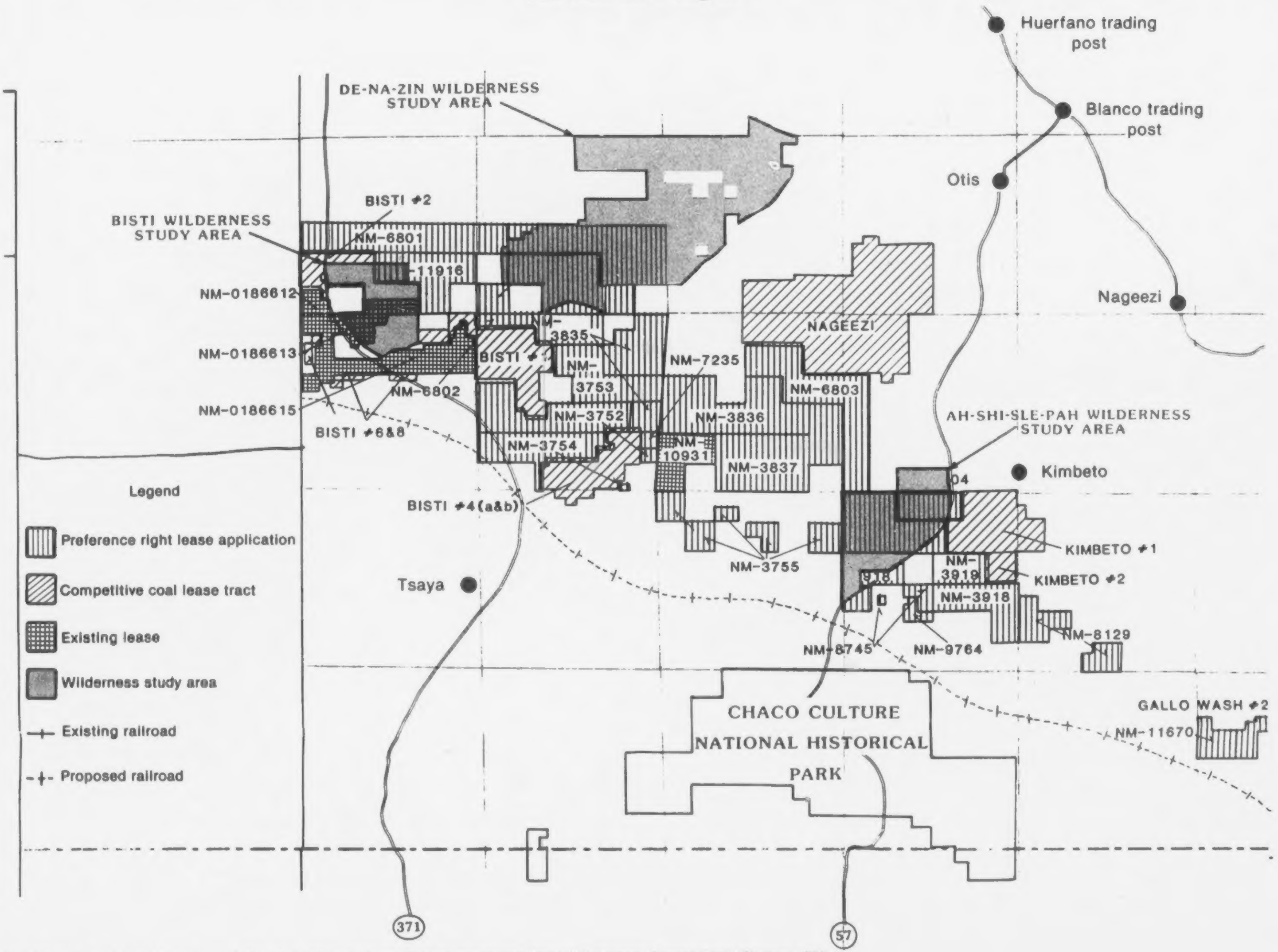
The combined effect of the *Berklund* decision and the DOI procedures for processing PRLAs means that environmental protection in the development of mines on PRLA tracts must be obtained through mitigation requirements in lease stipulations and/or permit conditions (see ch. 4). As with a lease issued competitively, approval of a PRLA does not constitute a right to mine, and the lessee still must obtain a surface mining permit based on a mining and reclamation plan.

The stipulations imposed on a PRLA can have a significant impact on its development potential. Final showings must reflect the effects that proposed lease stipulations are expected to have on the "commercial quantities" test. In San Juan, the first lease stipulations for PRLAs were developed as a result of the draft Environmental Assessment for Coal Preference Right Leasing in spring 1981. More stipulations were developed and the earlier ones refined when PRLAs were incorporated in the second regional draft EIS in fall 1983 (5). As a result of these stipulations, industry has been required to revise its proposed mine designs and the "final showings" based on them. Consequently, all showings submitted to date may be considered preliminary, and BLM may request new "final showings" based on the current stipulations (3). Further revisions could be possible as additional data on environmental compatibility are collected within the region (which has not yet held a first round lease sale). BLM has determined that approximately 45 percent of the area covered by the 26 PRLAs pending in San Juan is acceptable for surface mining (5), but controversy surrounds the six PRLAs that underlie Wilderness Study Areas (WSAs) (see fig. 8).

While many legal, administrative, and procedural issues related to the PRLAs have been addressed by DOI and the courts, a number of new questions are likely to arise as the applications are processed. It is clear that the amount of annual coal production from PRLAs could be substantial. However, in recent years, environmental assessment and planning for PRLAs has engendered a considerable amount of controversy. Much of the debate focuses on what critics perceive as the failure of the present PRLA processing system to give full consideration to environmental values. Because there was no comprehensive land use planning mandate when PRLAs were issued, they would only be analyzed in the context of such plans if they are included in current planning efforts. Yet the program regulations (both the 1979 and 1982 versions) allow BLM to process PRLAs outside the cycle of ongoing comprehensive land use plans if including them in a plan would mean delaying their processing beyond December 1, 1984.

This land use planning exemption, coupled with the lack of pre-lease screening procedures (except for the unsuitability criteria), raises doubts about the ability of the PRLA program to minimize the environmental risk of issuing preference right leases. As in other instances where final decisions on environmental protection and impact mitigation are deferred to the mine plan stage, considerable doubt surrounds the willingness of regulatory agencies to deny a permit rather than accommodate mining decisions.

Figure 8.—Relation Between Wilderness Study Areas and Coal Tracts in the Northern Portion of the San Juan River Region


Huerfano trading post
Blanco trading post
Otis
Nageezi
DE-NA-ZIN WILDERNESS STUDY AREA
BISTI #2
BISTI WILDERNESS STUDY AREA
NM-6801
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NM-0186612
NM-0186613
NM-0186615
NM-6802
BISTI #6&8
BISTI #
NM-3835
NM-3753
NM-3752
NM-3754
NM-7235
NM-3836
NM-10931
NM-3837
NM-6803
NAGEEZI
BISTI #4(a&b)
Tsaya
NM-3755
AH-SHI-SLE-PAH WILDERNESS STUDY AREA
Kimbeto
04
KIMBETO #1
KIMBETO #2
NM-3919
918
NM-3918
NM-8745
NM-9764
NM-8129
GALLO WASH #2
NM-11670
CHACO CULTURE NATIONAL HISTORICAL PARK
371
57
Legend
▥ Preference right lease application
▨ Competitive coal lease tract
▦ Existing lease
■ Wilderness study area
—+— Existing railroad
-+- Proposed railroad

SOURCE: Bureau of Land Management, *San Juan River Regional Coal Environmental Impact Statement*, Second Draft (October 1983).

A second source of controversy is the differences in specificity between the 1979 and 1982 regulations about the contents of environmental reviews required to comply with the *Berklund* decision. The 1979 regulations required applicants, as part of their "initial showing," to provide a brief description of existing land uses on and adjacent to the PRLA; known geologic, visual, cultural, or archaeological features on the tract; and known wildlife habitat and habitats of threatened or endangered plant and animal species that may be affected by mining operations. Moreover, the 1979 program required an initial showing to include a brief description of planned measures to prevent or control fire; to mitigate or prevent soil erosion, ground and surface water pollution, damage to wildlife or its habitat, air and noise pollution, hazards to public health and safety, and impacts to the social and infrastructure systems of local communities; as well as a description of any plans the applicant might wish to submit pertaining to proposed reclamation procedures. All of these requirements were eliminated in 1982, and replaced with a blanket statement authorizing the Department to request or the applicant to submit any "information necessary to conduct an environmental analysis of the proposed mining operation, formulate mitigating measures and lease terms and determine commercial quantities" (34 CFR 3430.2-1(d)).

The 1979 PRLA regulations also specified the contents of EAs or EISs on PRLAs:

1. an evaluation of direct and indirect potential impacts including cumulative impacts on the physical and socioeconomic environment;
2. an evaluation of the technical and **natural** potential for reclamation;
3. an evaluation of reasonable alternatives to leasing, including exchange possibilities;
4. recommended lease terms and special lease stipulations to prevent unacceptable environmental or social impacts; and
5. specific environmental protection or mitigation procedures.

In 1982, DOI eliminated these regulations, noting that such standards would be dealt with through internal agency memoranda and directives. To date, three instruction memoranda concerning PRLA processing and compliance with NEPA have been issued. Although some BLM officials feel that the requirements listed above are still met during EA/EIS preparation, some field personnel argue that the departmental procedures do not provide sufficient guidance.

The elimination of the guidelines for environmental showings and analyses during the processing of PRLAs has captured the attention of environmental groups, who have threatened to reopen the *Berklund* case. These groups contend that environmental analyses to date have been inadequate with regard to discussion of reclamation, water resources protection, and the impact of leasing on wilderness areas. Furthermore, environmental groups argue that those analyses do not include sufficient detail on mitigation techniques to assure environmental compatibility, do not define specific lease stipulations, and fail to investigate alternatives to leasing such as exchanges. Proponents of the current (1982) PRLA program contend that the requirements for application of the 20 unsuitability criteria to all PRLAs, preparation of an EIS or EA for all PRLAs, and inclusion of mitigation requirements in a final showing provide adequate environmental protection prior to leasing—especially given the detailed analysis at mine plan review.

An additional concern about PRLAs is their significance to regional leasing levels. For example, in the San Juan coal region, PRLAs are estimated to contain one-half to two-thirds of the surface minable coal (5). In part because it was assumed that the regional leasing level in the San Juan Basin would reflect the large capacity of PRLAs, BLM's planning for competitive leasing in the region focused on a relatively limited area. The unexpectedly high regional leasing level then required an accelerated regional planning effort. This situation was compounded by BLM's decision to include processing the PRLAs only as a "no action" alternative in the first draft regional lease sale EIS. That decision was criticized widely, and partly as a result, a second draft EIS had to be prepared which included issuance of the PRLAs in the action alternatives considered. However, the recently issued draft EIS on the Powder

River Round Two lease sale also included processing 67 PRLAs in the "no action" alternative.

Since mid-1983, BLM has been reviewing its PRLA processing procedures, in part in response to the issues discussed above, but no additional changes have been made to the regulations. Unless concerns about the adequacy of environmental assessment of PRLAs are resolved to the reasonable satisfaction of all parties, PRLA processing probably will be stalled by its critics. This may involve the preparation of EISs for **all** PRLAs. Under the present discretionary provisions of the regulations, BLM had planned to prepare EAs (rather than EISs) in processing most PRLAs. Among environmental groups, this was a cause for concern because of the diminished scope, preparation requirements, and public involvement required for EAs as compared with EISs. This position has now changed, and the Bureau reports it is preparing EISs for "most" PRLAs (4). Further, it may be necessary to require that **all** PRLAs be incorporated in land use and activity planning in order to ensure adequate environmental protection, even though the courts have ruled that this is not necessary under present laws and regulations. Consequently, congressional action may be required if further stalling of the processing of PRLAs is to be avoided.

ENVIRONMENTAL PROTECTION

In addition to the specific requirements of FCLAA and FLPMA related to planning and environmental assessment, a wide range of other laws provide the context against which environmental compatibility is judged. Some of these laws are incorporated in the leasing process directly (e.g., unsuitability criteria derived from the Surface Mining Act, or the Endangered Species Act), while others are addressed primarily during mine plan review (e.g., Clean Air Act). These are listed below. A more detailed discussion of the Surface Mining Control and Reclamation Act, the National Environmental Policy Act, and the Clean Air and Water Acts, and how they affect the Federal coal leasing program may be found in appendix A.

- **Act of September 28, 1976:** Provides for the regulation of mining activity within, and to repeal the application of mining laws to, areas of the National Park System.
- **Antiquities Act of 1906:** Regulates antiquities excavation and collection (including fossil remains).
- **Archaeological and Historical Preservation Act of 1974; Archaeological Salvage Act:** Provides for recovery of data from areas to be affected by Federal actions; provides for preservation of data (including relics and specimens) at every Federal construction project.
- **Bald Eagle Protection Act of 1969:** Protects bald and golden eagles.
- **Clean Air Act:** Establishes air quality standards; sets requirements for areas failing to meet standards; provides for prevention of significant deterioration of air quality in clean air areas; may require a Federal permit.
- **Clean Water Act:** Establishes water quality goals and requires States to set standards for meeting those goals; imposes effluent limitations on discharges from point sources; requires permits for discharges.
- **Endangered Species Act of 1973:** Protects endangered and threatened species and critical habitat affected by Federal actions; requires prior consultation with Fish and Wildlife Service.
- **Fish and Wildlife Coordination Act of 1934:** Requires consultation about water resource development actions that might affect fish or associated wildlife resources.
- **Historic Preservation Act of 1966 (as amended):** Establishes systems of classifying properties on or eligible for inclusion on National Register of Historic Places; mandates Federal agency consultation with Advisory Council and State historic preservation officers.

- **Migratory Bird Treaty Act of 1918:** Requires enhancement and prevention of loss of migratory bird habitats.
- **Multiple Use-Sustained Yield Act of 1960:** Requires management of National Forests under principles of multiple use so as to produce a sustained yield of products and services.
- **National Environmental Policy Act of 1969:** Makes environmental protection part of the mandate of every Federal agency; requires detailed environmental impact statements for major Federal actions significantly affecting the quality of the human environment.
- **National Forests Management Act of 1976:** Provides for a comprehensive system of land and resource management planning for National Forest System lands.
- **Noise Control Act of 1972:** Requires publication of information on limits of noise required to protect public health and welfare; preempts local control of railroad equipment and yard noise emissions.
- **Resource Conservation and Recovery Act:** Establishes guidelines for collection, transport, separation, recovery, and disposal of solid waste.
- **Safe Drinking Water Act of 1977:** Establishes mechanism for National Primary Drinking Water Standards.
- **Soil and Water Resources Conservation Act of 1977:** Requires appraisal by Secretary of Agriculture of information and expertise on conservation and use of soils, plants, woodlands, etc.
- **Surface Mining Control and Reclamation Act of 1977:** Establishes performance standards for environmental protection in surface mining operations; mandates State permit programs to ensure performance standards can be met; allows States to have primary enforcement responsibility under approved programs; requires States to establish procedures for designating areas unsuitable for mining; requires surface owner consent on split estate lands.
- **Wild and Scenic Rivers Act:** Provides for preservation of certain rivers or portions thereof in their natural state.
- **Wilderness Act of 1964:** Provides for establishment of wilderness reserves; requires preservation of wilderness areas in an unimpaired condition.

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Chapter 4

Planning and Environmental Assessment in the Federal Coal Leasing Program

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Planning and Environmental Assessment in the Federal Coal Leasing Program

Several aspects of the current leasing and environmental protection programs described in the previous chapter have been criticized as inadequate to assure the development of Federal coal lease tracts in an environmentally compatible manner. Specific areas of concern relate to the role of regional leasing rates, the adequacy of presale data and analyses, the application of the unsuitability criteria, the use of mitigation measures, the deferral of decisionmaking, the role of Regional Coal Teams (RCTs), the effectiveness of public participation, the special concerns of affected Indian Tribes, the applicability of the program to areas in which the Federal Government does not own the surface (split estate leasing), and the use of lease exchanges to reduce environmental risk.

This chapter documents the concerns that have arisen about these aspects of the leasing program. The chapter begins with an overview of the expectations about the program held by the various participants in leasing. These expectations are one context against which the validity of concerns is assessed. The remaining sections of this chapter discuss each of the issue areas listed above.

It should be noted that there are other, nonenvironmental, criticisms of the current leasing program. The allegations that the government did not receive fair market value for the coal on leases sold since 1981 and other economic issues were addressed by a specially appointed Advisory Commission on Fair Market Value Policy for Federal Coal Leasing and are not discussed in this report. Criticisms related to the assessment of socioeconomic and community impacts and of the effects of coal conversion facilities (e.g., powerplants and synfuels plants), and issues surrounding surface owner consent, generally were considered beyond the scope of this study, unless they were found to be inseparable from environmental concerns.

EXPECTATIONS FROM THE LEASING PROGRAM

Participants in the Federal coal leasing program (including the Bureau of Land Management—BLM, coal companies and mine operators, States, special interest groups such as Indian Tribes and environmental organizations, and the public) have definite—and sometimes conflicting—expectations of the program's environmental planning and assessment. Some of these expectations focus on program policy as set out in legislation, while others relate to the manner in which the program is implemented in regulations and in practice. Controversy arises when the expectations of one or more parties are not fulfilled, or when the parties disagree about whether an expectation is reasonable or is being met.

The controversies characterized by the differing expectations can be divided into four general areas. They are: program predictability and stability, program administration, program implementation, and public participation. This section describes those expectations and discusses points of agreement and disagreement. Because this discussion of expectations incorporates most of the major issues, it serves to introduce those issues, which are analyzed separately in more detail in subsequent sections of this chapter.

Program Stability and Predictability

There is a general expectation among the parties to the leasing process that it will be stable and predictable, and that its legal and regulatory framework will remain essentially unchanged given the time and effort that went into forging a consensus on the adequacy of that framework. Stability and predictability in methods of assessing environmental compatibility lend assurances that environmental decisions will be consistent among regions and over time. Furthermore, stability and predictability in the program as a whole are needed by the industry, BLM, other Federal and State agencies, local communities and residents, and interest groups for their business and administrative planning.

One important stability/predictability expectation common to all parties is that the leasing program will not be driven by political or interest group priorities, which can change over relatively short periods of time. When the interests of two or more parties conflict, and each desires its interests to be accommodated, it is necessary that the program strike compromises in an impartial manner. Problems arise when one party is or appears to be uniquely able to control or drive the program (e.g., when only a coal company has access to a particular data set or when a lawsuit is threatened). Another problematic circumstance arises when BLM planning decisions made at the District or State Office level are overridden in Washington, D.C. (whether by the executive or legislative branch) for political or other reasons unrelated to the leasing program. The major concern is that these reasons, even if a desired goal is achieved, cannot be depended on to be invoked consistently in the future if needed, or may be invoked to reach a decision that is inconsistent with overall program goals.

A second major expectation about predictability and stability in the leasing program is that the amount of coal offered, its quality and location, and the timing of its sale will match the industry's need (and/or consumer demand) and will not unduly strain BLM's planning and assessment capabilities or the resources of local communities and residents. There appears to be general consensus that the parties prefer a regular, steady pace of leasing rather than very large offerings over a short period. Moreover, most parties expect the lease sale schedules to be flexible, such that sales could be delayed if pre-sale planning and analysis were not complete.

Finally, there is a general expectation that BLM will maintain a stable staff resource for regional planning functions. Concern has been expressed by all parties to the leasing program that attrition within BLM, as well as the Bureau's practice of rotating field personnel every few years, prevent the development of an "institutional memory." This contributes to data inadequacy and hinders maintenance of continuity in public participation. Moreover, with recent budget and staff cutbacks, there is concern among some parties that BLM will not be able to maintain the field expertise needed for land use and activity planning.

Program Administration

There are three general expectations about leasing program policy and the way it is administered. First, that the regulations will be in compliance with the legislation; second, that the coal leasing and decisionmaking process will be transparent in both theory and practice; and third, that the environmental impacts of developing Federal coal will be assessed before tracts are offered for lease, and only environmentally acceptable tracts will be offered. Substantial disagreement exists among the parties over whether these expectations are being met.

In the first instance, environmental groups have sued BLM, alleging that the 1982 regulations are not in compliance with the legislative mandate. Specific concerns include continued reliance on management framework plans (MFPs), the elimination of most standards for data adequacy, changes in the scope and application of the unsuitability criteria, relaxation of the diligence rules, inadequate environmental review requirements for preference right lease applications (PRLAs), the use of a new leasing methodology that results in far higher leasing levels, and elimination of several opportunities for public hearings.

Less polarization exists about the need for the coal leasing process and the BLM and RCT decisionmaking processes to be transparent. All parties expect to be able to understand, on a day-to-day basis, what BLM is doing and plans to do in the future, and all parties agree that the degree to which this expectation is met varies among program areas and leasing regions. In some cases, it is unclear how a decision was reached due to incomplete documentation (e.g., a statement such as "the unsuitability criteria were applied during land-use planning" may be the only documentation of those decisions that appears in an environmental impact statement—EIS). In other cases (e.g., exchanges), the participants find the process difficult to follow because the departmental policies or procedures for a particular activity are not codified in the program regulations, are overly vague, or change frequently.

There is also general agreement that the environmental impacts of coal development should be analyzed to some degree prior to the lease sale, but disagreement about what constitutes "adequate" environmental impact assessment (including data and analysis). Few argue that a lease should constitute a 100 percent guarantee that all portions of a leased tract are minable in an environmentally compatible manner; some flexibility is needed to accommodate changing circumstances, new data, or advances in mining and reclamation techniques. Similarly, few believe that a lease should include **no** guarantees about an operator's ability to develop and reclaim a tract in an environmentally compatible manner. In between these two extremes, however, there is much disagreement about the extent to which a lease indicates a tract to be minable.

Most operators would be pleased to accept a lease that constituted a 100 percent guarantee of minability, but recognize that all business decisions—including a bid on a lease sale—involve some risks. Thus, the amount bid for a lease tract incorporates an operator's assessment of the **economic risk** that the permitting agency will find a tract, or a portion thereof, unminable for environmental reasons post-lease. The industry would prefer to accept that economic risk rather than the risks posed when coal resources are closed to mining or extensive mitigation measures imposed pre-lease. However, they do want assurances that a tract offered for lease does not contain any "fatal flaws" that would absolutely rule out mine development.

While post-lease permitting provides a final check on environmental compatibility based on a very extensive data base, areas are less likely to be excluded from mining at this stage. Therefore, environmental and other interest groups view the industry's assumption of the economic risk as imposing an **environmental risk** on the "public." This is the risk that a tract will be leased and eventually mined with a significant loss of environmental resources, or significant, irreversible damage. Consequently, these groups would prefer to see a lease reflect not just an assurance that there are no fatal flaws on the tract, but a guarantee that all reasonable environmental and other resource values have been identified and analyzed for regional and national importance, and that if coal mining would significantly reduce the value of important noncoal resources, then the tract will not be offered for lease but managed in such a way as to protect those other resources.

The agencies that approve mining and reclamation plans and issue mining permits (State regulatory agencies with approved programs, or the Office of Surface Mining—OSM) have expectations that are caught between the operators' and the interest groups'. On one hand, the regulators have a statutory responsibility to assess the environmental compatibility of coal mining on a particular tract, and would prefer that a decision whether to offer a tract for lease does not usurp their authority to evaluate minability. On the other hand, the regulators don't want **all** decisions about environmental compatibility passed on to them.

The BLM and the Forest Service also have a statutory mandate to assess environmental compatibility—both for multiple-use conflicts and the unsuitability criteria—prior to lease sales. Their hope is that they might have sufficient time and resources to fulfill this mandate. Their expectation is that they will be able to screen out the major problem areas, as identified by BLM and Forest Service staff and regional activists, but will have to defer many of the difficult decisions—those which require extensive data (e.g., alluvial valley floors—AVFs) or technical judgments about mitigation and reclamation—to the mine plan stage. In some cases, however, BLM has been criticized by interest groups for deferring more than just the difficult decisions and therefore increasing the environmental risk of leasing.

Program Implementation

Expectations about the implementation of the Federal coal leasing program center around whether BLM's day-to-day practice is in accord with the theory of the program—that BLM and the RCTs implement the spirit of the laws and regulations, not just the letter. Specific concerns in this area include: that land use planning and tract selection will be based on priorities for different resource values; that BLM's data base and analyses will support informed decisions about environmental compatibility; that the interests of all concerned parties will be dealt with; and that leasing decisions will be consistent with land use planning and environmental impact analyses.

The issue of how resource priorities are assigned and what value is assigned to coal compared to other resources is controversial. During land use planning, anticipation of a high leasing level can unduly influence land use decisions in favor of potential coal development. In environmental impact assessment, some parties to the leasing process argue that BLM gives undue weight to adverse impacts, to the detriment of potential benefits of leasing and developing Federal coal. For example, in some areas coal development may play a role in easing unemployment. Furthermore, companies and some States argue that BLM does not give sufficient consideration to the revenues from leased tracts when weighing the relative costs and benefits of Federal coal development. Finally, there is some concern that BLM's data and analyses are inadequate to capture the regional importance of particular impacts. Thus, they might indicate that a particular critical habitat will be destroyed if mining proceeds, but not whether it is a unique or common habitat in the region. One element of this concern is the recent elimination of the threshold concept for assessing cumulative regional impacts prior to the EIS.

For tract ranking, controversy arises when a tract that is ranked low for environmental values (e.g., reclamation potential) is carried forward because it has a medium or high ranking for coal resources. Critics of these rankings do not believe that the coal resource potential should receive a greater weight than other values. Disputes also result when it is unclear how (or whether) the various ranking factors are weighted for importance.

There is a general expectation among parties to the coal leasing program that BLM's data base and analyses must be adequate to make informed decisions about environmental compatibility, but disagreement about what is "adequate." The parties also expect BLM to consistently seek out and use all relevant information about an area (e.g., from other Federal and State agencies, mine plans, and operating mines), rather than relying on data available in-house. Finally, there is consensus that the Federal land management agencies should coordinate their data collection and planning so that multiple-use decisions are consistent among agencies.

Expectations diverge on how leasing decisions should accommodate a perceived lack of data. Some parties expect tracts to be labeled "unsuitable pending study" or dropped from further consideration for a particular lease sale if sufficient data are not available to make an informed decision about environmental compatibility. Others contend that such tracts should be carried forward as "acceptable pending study" and uncertainties resolved through the extensive data gathering and analysis involved in preparation of the mine plan and permit application. There is consensus, however, that detailed technical lease stipulations should **not** be used as a substitute for inadequate data.

Special interest groups expect environmental issues to be addressed in land use and activity planning regardless of whether those issues have a constituency or whether they might eventually be analyzed by another agency. These groups are critical of the practice of not evaluating an impact area unless someone raises the issue. On the other side of this coin, many parties expect priorities to be assigned to issue areas, such that potential impacts in major issue areas receive greater attention than impacts concerning issue areas that are not anticipated to be significant.

Finally, all groups expect their interests to be considered and dealt with, but disagree about whether the interests of other groups are as important as their own. There is consensus that decisions made under the leasing program should not usurp the authority of other decisionmakers. Thus, there is general agreement that issues legally or traditionally belonging to the States (e.g., water rights), the Forest Service (land use and management decisions on National Forest lands), OSM (technical and economic feasibility of reclamation), or other agencies, should not be decided by BLM.

Public Participation

Expectations about public participation in the Federal coal leasing program center around both the opportunities for such participation (e.g., whether or not hearings are held on particular subjects), the relative ability of the parties to participate, and the consideration of public comments in leasing decisions.

All participants in leasing expect that the program will include sufficient opportunities for public participation, but the number and scope of what is offered are controversial. Environmental and other public interest groups are especially critical of the recent changes in regulations that eliminated four opportunities for public participation: on Department of Energy (DOE) production goals, on draft regional leasing levels, on local community impacts prior to the EIS, and on the application of the unsuitability criteria during land use planning. As a result of these reduced opportunities, there is no assurance that views communicated to BLM by any of the parties at interest are "on the record," the way they would be if there were a formal opportunity for public comments or hearings.

Even when formal hearings or public comment periods are provided, frustrations still arise on all sides. The public and other interest groups expect the format, location, and timing of such hearings or other opportunities for participation will allow them sufficient and reasonable access to the process. BLM expects that when they hold a public hearing or provide a public comment period, interested individuals and groups will participate on those occasions, and not wait until a decision has been made and then challenge it.

A second source of frustration with public participation is the perception that the Federal Government, when making leasing decisions, at times ignores material provided by various parties. For example, in some regions nearly all parties to the process provided information indicating that the proposed regional leasing levels were too high, yet only in one region were they adjusted downward at all, and then just slightly. Similarly, instances can be found where data provided to BLM during land use planning (e.g., on the location of missile silos) were ignored throughout most of the decision process. In other instances, data provided by the general public have been instrumental in the identification of major issue areas (e.g., wildlife habitat in Powder River). As noted previously, this problem is exacerbated by personnel attrition and rotations within BLM.

Finally, there is a general expectation that all aspects of BLM's decisionmaking will be sufficiently well-documented and clearly explained in order to facilitate participation by all affected parties. This expectation includes not only that the decisionmaking process itself will be transparent (as discussed above), but also that the documentation will be readily available to all interested parties. Unpublished data and analyses on which decisions are based, or documents with limited availability, also lead to frustration by all parties.

REGIONAL LEASING RATES

The regional leasing rate is the **ratio** of: 1) the amount of coal to be offered for lease; and 2) the period of time during which all the planning and assessment activities that support a lease sale must be completed. Determining the amount of coal to be offered for lease during a round of sales in a region—the regional leasing level—is one of the major decisions made during the activity planning portion of the leasing process, while schedules for the planning and analysis that support a lease sale are set at the outset of activity planning (or at the beginning of land use planning if an MFP needs to be updated to support leasing decisions).

In recent years, the regional leasing rates have been high because the Department of the Interior (DOI) increased the amount of coal to be offered for lease in most regions, while the lease sale schedules have remained fixed. As a result, BLM field staff did not always have sufficient time for adequate pre-sale planning and environmental assessment of the large number of tracts to be evaluated.

This section describes the overall process for setting regional leasing levels and lease sale schedules, discusses the methodologies for assessing the demand for coal reserves, and evaluates the environmental implications of high lease rates.

Regional Leasing Levels

The regional leasing level* is the amount of federally owned coal resources (expressed in million tons of recoverable reserves) that the Secretary of the Interior determines is necessary to meet the regional demand for coal reserves. It can include a "security factor" of at least 25 percent to account for uncertainties in data and methodologies in assuring that there is no leasing shortfall. In setting a regional leasing level, the Secretary relies on recommendations and comments from the applicable State BLM offices, RCT, State Governors, and other interested parties (e.g., Indian Tribes). Proposed leasing levels also are subject to public review and comment at RCT meetings and through Federal Register notice.

Regional leasing levels are addressed twice in the overall leasing process. First, an initial range of leasing levels is established near the start of activity planning, following the call for industry expressions of interest. This range is used as the basis for selecting alternative combinations of tracts to be evaluated in the regional lease sale EIS. Second, following publication of the EIS, the Secretary determines the amount of coal to be offered for lease.

The Process

The BLM National Director assigns a lead BLM State Director for each lease sale, who has the initial responsibility for suggesting a broadly stated range of draft leasing levels for a Federal coal region. The lead State Director then appoints a Regional Project Manager from BLM, who evaluates land use planning data, coal resource and demand information (based on the methodologies described below), consults with the State Governors' representatives on the RCTs, and proposes an initial range of leasing levels to the lead State Director. Following the lead State Director's approval, the initial range (with supporting technical information) is sent to the RCT members and State Governors for review. The RCT evaluates the draft initial range of leasing levels, discusses them at a public meeting, and recommends a preferred level to the Secretary.

The Regional Project Manager drafts a package document, including the initial range, RCT recommendations, responses to questions and clarification of issues raised by the RCT, any new or additional technical information, and any alternative ranges, to be given to the Secretary. The initial range is not supposed to be altered to conform with RCT or State recommendations, but can be updated to reflect the best information available to the Project Manager. Moreover, high, medium, and low projections will be identified if a State RCT member so requests.

The Secretary (or his designee, the Assistant Secretary for Land and Minerals Management) then consults with the Secretary of Energy, the Attorney General, affected Indian tribes, and the State Governors, and sets the regional leasing level to be used for the selection of alternative combinations of tracts to be evaluated in the EIS.

A similar process is followed after publication of the EIS in making the final decision about how much coal is to be offered for lease. The RCT evaluates the regional leasing level in the context of the EIS and other data and analyses developed since the initial draft range was formulated, discusses the results of their evaluations at a public meeting, and recommends which tracts should be offered. The Secretary then decides the final regional leasing level based on: consultations with the parties listed above; the potential economic, social, and environmental impacts of coal leasing, as identified in the final EIS; industry expressions of interest; projected regional coal supply and demand; special opportunity sales; the regional level of competition; U.S. coal production goals and national energy needs; and other pertinent factors including land use planning data and coal resource information (43 CFR 3420.2(b); ref. 13).

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*Referred to as a regional leasing "target" under earlier regulations.

The Methodology*

As the coal leasing program has evolved, the process of setting leasing levels has become more complex and more controversial. The most difficult aspect of determining the appropriate regional leasing level is projecting regional coal supply and demand. Prior to 1982, that level was set by comparing the future **demand** for coal in a region—as projected by the National Coal Model, an economic model managed by DOE—with the ability of the **capacity** of existing and proposed mines to meet that demand without additional leasing. Information about capacity was compiled through a survey of individual mines and tracts. If this analysis projected a shortfall (in tons per year), it would be converted to an estimate of reserves of Federal coal that should be offered for lease to fill the gap. The formula included a "security factor" of 25 percent to allow for the uncertainties inherent in such projections.

This approach was criticized widely for two reasons. First, it was argued that regional leasing levels based on projections of consumption could have underleasing and anticompetitive effects because they did not allow the industry an adequate cushion of reserves to accommodate future uncertainties in demand—especially in light of the leasing moratorium of the 1970's. Proponents of this theory contended that higher leasing levels were needed.

Second, the numerous critics of the National Coal Model argued that it assumed unrealistically high figures for the future demand for electricity (and thus for coal), and that it incorporated inaccurate assumptions about transportation costs, oil displacement in electricity generation, coal reserves, and other factors. These criticisms supported lower (or at least unchanged) leasing levels.

After evaluation of these criticisms and other policy considerations, in 1982 DOI instituted a policy **of leasing to meet current industry demand for reserves** (rather than future demand for production). This policy has been defined by DOI as "to offer as much coal as is environmentally feasible and consented to by involved surface owners and to allow the market to determine which tracts are desired for leasing" (12). Other policy considerations in setting leasing levels include preserving opportunities to increase the level of competition for Federal coal resources, and giving due consideration to environmental and socioeconomic impacts (12). The effect of this policy change was to increase leasing levels.

After several months of discussion with the RCTs, DOI adopted six different methodologies to calculate the current demand for Federal coal reserves: production, inventory, contracting rate, expressions of interest, past sales, and minimum leasing. Each of these methodologies results in an estimate of the annual shortfall in coal production, which is then multiplied by the product of the average mine life and the percent of the coal reserves that are federally owned to derive the leasing requirement stated in recoverable reserves. This leasing requirement may then be multiplied by an appropriate security factor (25 to 100 percent) to insure against underleasing. The six quantitative methodologies are described briefly below; appendix B gives the formulas and an example illustrating their use.

These methodologies primarily are used to derive the initial draft range of leasing levels at the outset of activity planning. The results of the formulas are then refined based on any new information, and used to set the final leasing level. However, this timing means that the initial draft leasing level will be based only on the limited information available about tracts from land use planning. In practice, once the initial range is set, it is extremely difficult to reduce for environmental reasons.

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*The information on methodologies for setting regional leasing levels is drawn primarily from refs. 5 and 12.

The BLM Project Manager is expected to use all six of these methodologies to provide as much information as possible to the RCT members. However, the procedures may be modified or supplemented by the Project Manager as needed. For example, data inputs may be presented in whatever form is most useful (e.g., a single number, high/low estimates, or broad ranges).

The six methodologies rely heavily on BLM projections of mine capacity and coal production for a target year (e.g., 1990, 1995). Capacity is the amount of coal BLM estimates could be produced from all mines within a region in the target year (if demand develops) without further Federal coal leasing. Information about annual mine capacity and potential limitations on that capacity is collected through a mine- or tract-specific survey. Productive capacity may be limited by coal that is of unmarketable quality, leases with access problems, and PRLAs with issuance problems. However, productive capacity would not be reduced due to a lack of expected demand for coal, which would be captured in the production forecast.

Coal production forecasts are based on a variety of published long-range national projections, including those from the National Coal Association and DOE, as well as region-specific forecasts from National Coal Model runs using modified assumptions.

The Production Method

The production method of quantifying current demand for coal reserves identifies the minimum quantity of coal needed to meet the production forecast by subtracting projected mine capacity from that forecast. This is the same method used pre-1982, except that it does not include a security factor. According to DOI, the primary differences between the production method and those described below is that it does not take into account industry's desire to hold coal in a nonproductive status or the need to maintain competition within the coal industry. Thus, DOI considers this method to be a "point of reference" on how the leasing level would have been set under the 1979 leasing program.

The Inventory Method

The inventory method allows for nonproducing reserves as a means of dealing with the uncertainties in future demand. This methodology estimates average industry holdings based on a survey of active regional coal companies' ratio of reserves to production. The annual shortfall is the product of this ratio and the production forecast (from the National Coal Model), minus the regional mine capacity. The inventory method is controversial because the ratio, and thus the resulting leasing level, increases during periods of low demand and decreases when demand is high (unless the ratio is calculated from a multiyear average). This result seems counterintuitive to many critics of the leasing program.

The Contracting Rate

This method focuses on the rate at which coal is being contracted for development in a region in relation to the total amount of coal that has been leased but not yet developed. It is intended to calculate a leasing level high enough to ensure competition (in the DOI example, five bidders) for contracts to deliver coal to consumers. However, because this method uses a ratio of reserves to production, it is subject to the same flaw as the inventory method—the weaker the market, the higher the leasing level established under the contracting method.

Expressions of Interest

DOI considers expressions of interest to mimic the marketplace in that they allow each company to assess its own needs for Federal coal reserves. However, the Department recognizes that even "thorough" expressions of interest—in which the company has done extensive work in defining the resource—may overestimate the amount of coal that the industry will actually be willing to lease for fair market value.

Past Sales

The past sales method does not result in a quantitative leasing level, but relies on observations of past coal lease offerings; e.g., the bonus bids on a price per ton basis, the number of bidders and the bids received, and the number of tracts that did not receive opening bids or that did not receive fair market value (as defined by BLM post-sale). If trends of higher bids and increasing numbers of bidders are observed, increased leasing may be appropriate. The converse—less leasing during a trend of lower bids and few bidders—does not necessarily hold because companies may decline to bid in a region due to factors other than low demand (e.g., a perception that tracts are overpriced or were delineated in an undesirable way). Because relatively few lease sales have been held under the current program, this methodology has been of limited use.

Minimum Leasing

Finally, the minimum leasing method establishes a low bound for leasing. It calls for adding the reserves needed for maintenance and bypass tracts, plus reasonable expansion of existing mines. A minimal amount of reserves needed for new production opportunities also may be included. The primary data sources for this method are tract delineation reports and expressions of interest. However, tract delineation is normally carried out simultaneously with the procedures for setting the leasing level, and, as noted above, expressions of interest are subject to some uncertainties. Therefore, the reliability of this method can be reduced by insufficient data.

Effects of High Leasing Levels

DOI's decision to use these six methodologies—particularly the inventory and contracting methods—has been controversial because they have resulted in continuing pressure to offer more coal for lease than recommended by the RCTs and the State Governors. In December 1982, the Federal-State Coal Advisory Board* recommended to the Secretary that the inventory and contracting rate methods "should not be given priority but may be used at the discretion of the RCT" (13). The Secretary signed off on that recommendation, but simultaneously noted that, while that recommendation "removes any apparent mandate for the use of these two methods by the RCTs, I am hereby instructing Federal members of all RCTs to provide estimates using these methods, and to give those estimates due consideration during all RCT leasing level deliberations" (12). The apparent contradiction between those two Secretarial actions led the Advisory Board to recommend, at its 1983 meeting, that these methodologies be reviewed again. High leasing levels also have been the target of criticism by environmental groups, local communities, other surface management agencies, and the Commission on Fair Market Value.

In the long run, higher leasing levels imply that more federally owned coal will be mined, with the potential for **either** a higher or lower probability of adverse environmental impacts occurring if a tract is developed. Higher leasing levels could reduce this environmental risk because a greater number of tracts would be offered and, theoretically, companies would be able to choose those tracts that are the least expensive to develop and reclaim (and thus have the fewest environmental conflicts). Moreover, leasing more tracts might lessen the pressure to develop old (pre-moratorium) leases and PRLAs, which may be in environmentally sensitive areas because they were issued prior to the body of environmental law approved in the late 1960's and 1970's.

Where the direct cost of mining is **the** deciding factor in industry decisions about coal development, the argument that higher leasing levels reduce environmental risk might be valid. However, in actuality other considerations often are more critical than direct costs. These might include location (e.g., a tract adjacent to an ongoing mining operation, or the combined siting of a mine and a mine-mouth utilization facility); accessibility to transport; the amount of development capacity already available to a company, and the market for and the environmental characteristics and development costs of the coal included in that capacity; and the relative value of undeveloped tracts held by a company and those offered for lease (e.g., Btu value, sulfur content). In such situations, higher leasing levels will not necessarily reduce the risk that environmentally sensitive tracts will be leased and eventually developed.

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*The Federal-State Coal Advisory Board members are all the RCTs plus the BLM national Director.

Moreover, higher leasing levels place greater pressure on BLM to find more tracts environmentally acceptable for leasing. In the Powder River Coal Region, DOI's establishment of a lease offering at a level above the preferred alternative recommended by the RCT resulted in the lowest ranked tracts being offered for lease, including some not agreed upon by the RCT. The RCT considers these tracts to have relatively poor reclamation potential and to entail substantial socioeconomic impacts due to the inadequate local infrastructure (transportation, community facilities, etc.) (10b). In such cases, if more tracts are leased than can be developed, uncertainties about the location and level of mining activity make it difficult for local governments to plan for these impacts. Moreover, the high leasing levels led to otherwise avoidable conflicts between DOI and the RCTs, and made the leasing program appear insensitive to State and local needs.

In a different situation, in Uinta-Southwestern Utah, the lease target was 322 million tons but 555 million tons were offered for lease—including low-ranked tracts not in the target. According to DOI, the low-ranked tracts were offered because they had been evaluated for coal leasing, found to be suitable, and were ready to be offered for lease, and because they provided a means of testing the market (6). This is consistent with DOI's general leasing policy (noted earlier) "to offer as much coal as is environmentally feasible and consented to by involved surface owners and to allow the market to determine which tracts are desired for leasing." No bids were received on the low-ranked tracts.

In the Fort Union region, one factor in the leasing level decision was high early industry expressions of interest.* On the Dunn Center tract, for instance, the initial expression of interest was for 7,160 acres of Federal coal (over 500 million tons) for a liquefaction plant which already had begun the State permitting process. The tract was evaluated for its acceptability for leasing in land use and activity planning. Two sections of the tract important to the company's development plan contained portions of the Knife River Flint Quarry—a site eligible for listing in National Register (see fig. 9). These sections were carried forward through activity planning and included in the final EIS on the theory that detailed mitigation requirements (including preservation, if necessary) would be developed during mine plan review. Then, the company scaled down its plans for the synfuels plant, and DOI increased the minimum bid from $25 to $100/acre (6).

While the Secretarial Issue Document (SID) was being prepared, the company requested that the size of the tract be reduced to 2,100 acres—the tonnage they estimated the scaled-down liquefaction plant could accommodate given the construction schedule and the requirement that a mine be developed within 10 years after a lease is issued. The two sections of Flint Quarry were dropped from the tract (for political reasons) just before the SID was issued (11), but the remainder was offered for lease. The SID noted that a pending rule change in unsuitability criterion #7 would "remove these sections from the unsuitability determination," but that the proposed rule change would not become final in time for the scheduled August 1983 sale (18). As a result of these considerations, the company did not bid on the tract. DOI's decision not to reduce the size of the tract further was in part due to the entire area having been included in the final EIS, and in part because DOI determined that, if the plant were built and a smaller tract leased, subsequent leases would likely be needed at a future date to maintain coal production or prevent bypass (leaving "islands" of unmined coal) (6).

Lease Sale Schedules

Lease sale schedules also are addressed twice in the overall leasing process. First, a preliminary lease sale target date is established prior to the onset of land use planning for a particular sale. The target date is based on BLM field, State, and

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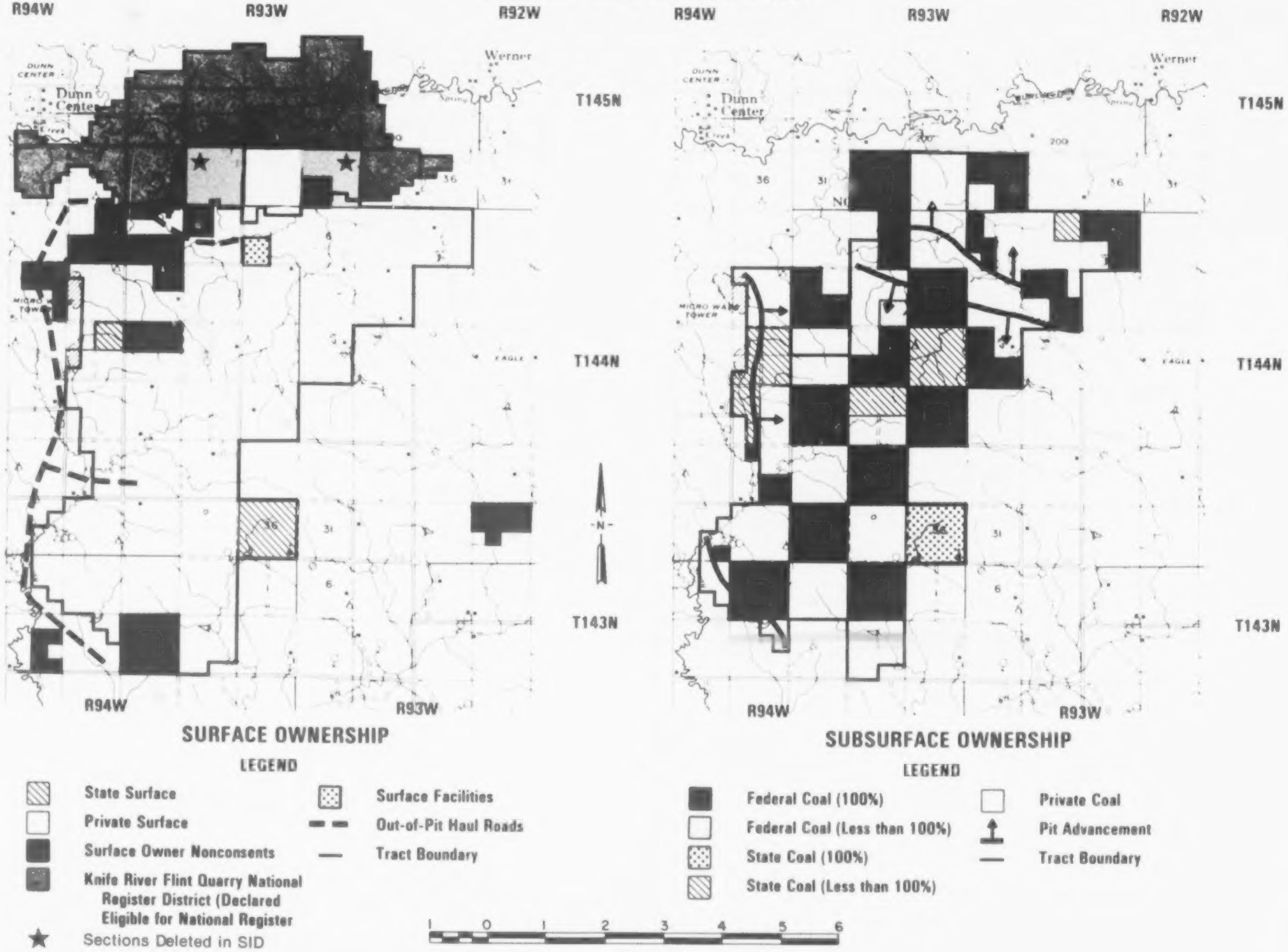
*It should be noted that the market for North Dakota lignite is limited to mine mouth conversion facilities. When coupled with the predominantly non-Federal ownership of the surface and mineral resources (94 percent and 69 percent or more, respectively, on each tract), this means that there is unlikely to be more than one bidder per tract.

Figure 9.—Dunn Center S.E. Tract


R94W
R93W
R92W
T145N
T144N
T143N
Dunn Center
Werner
Micro Wave Tower
Eagle
N
SURFACE OWNERSHIP
LEGEND
State Surface
Private Surface
Surface Owner Nonconsents
Knife River Flint Quarry National Register District (Declared Eligible for National Register
Sections Deleted in SID
Surface Facilities
Out-of-Pit Haul Roads
Tract Boundary
SUBSURFACE OWNERSHIP
LEGEND
Federal Coal (100%)
Federal Coal (Less than 100%)
State Coal (100%)
State Coal (Less than 100%)
Private Coal
Pit Advancement
Tract Boundary
1 0 1 2 3 4 5 6

SOURCE: Bureau of Land Management, Fort Union Coal Region Draft Environmental Impact Statement, July 1982.

Washington office recommendations as modified by the Secretary on the amount of time needed to complete pre-lease planning and environmental assessments. Key milestones in the target schedule are the deadlines for completion of the MFP amendments (or resource management plans—RMPs) and the draft and final EISs, and public and interagency review and comment periods.

Second, a final regional lease sale schedule is announced by the Secretary following completion of activity planning and final consultations with the Governors, surface management agencies, Indian Tribes, and the Attorney General.

The SID accompanying the 1979 coal leasing program regulations established preliminary lease sale target dates for three regions: Green River-Hams Fork, Powder River, and Uinta-Southwestern Utah (see table 5).

Preliminary leasing targets and sale dates were not established for the Fort Union and San Juan regions in this SID. Eventually, a target sale date of late 1982 was established for Fort Union (later postponed to mid-1983), and a 1983 target date was set for San Juan. The leasing program anticipated that follow-up sales would be held at 2-year intervals in each of the regions. With the exception of the San Juan region, most first round lease sales have occurred close to their original target dates. In San Juan, the schedule had to be extended when BLM decided to issue a second draft EIS to respond to the numerous criticisms of the first draft. Federal policy has been, however, to meet lease sale target dates when possible. Table 6 indicates the competitive lease sales that have been held or scheduled to date.

The original schedules acknowledged that land use planning had not been completed for all of the resource areas within the various coal regions. Most resource areas, however, did have an MFP to guide multiple-use decisions at the time the original dates were set. The major environmental analyses remaining were updating or amending the MPF (including application of the unsuitability criteria and surface owner consultation), tract delineation, site-specific analysis and preparation of the tract profiles, tract ranking and selection of the alternatives, and preparation of the draft and final EISs. As can be seen in table 6, the schedules in Green River, Powder River, and Uinta were met.

Effects of Inflexible Lease Sale Schedules

In each of the five Western coal regions, problems were encountered in meeting the lease sale schedules, which reduced the quality and quantity of data and analyses. Given that BLM was implementing a new, very complex program over a short period of time, this is not particularly surprising. However, the normal learning curve on a comprehensive set of new coal leasing rules was complicated by several other considerations that inhibited achievement of the preliminary target date. (These considerations include high regional leasing **rates**—the ratio of the leasing level and the schedule—whose environmental implications are discussed below.)

One problem was that field office recommendations as to the time needed to prepare for a lease sale were not always heeded by the Secretary. For instance, in at least two regions—Green River-Hams Fork and Uinta-Southwestern Utah—problems in meeting lease sale schedules were attributed in part to deadlines being accelerated to accommodate review and comment periods. That is, the time estimated by field offices to be necessary for the completion of data collection and analysis also had to include public, internal BLM and DOI, and interagency reviews. This may

Table 5.—1979 Lease Sale Target Dates

Region	Round I sale date	Preliminary leasing target (million tons)
Green River-Hams Fork	January 1981	531
Powder River	Early 1982	621 + 25% security factor, or 776
Uinta-Southwestern Utah	July 1981	109

SOURCE: Department of the Interior, *Secretarial Issue Document, Federal Coal Management Program*, vol. II, 1979.

Table 6.—Lease Sale Schedules

Sale	Sale date	Leasing target/level	Offered	Sold
		(millions of tons)		
Green River-Hams Fork[a] Round I	1/81;4/81;6/81	416	573	573
Uinta-Southwestern Utah[a] Round I	7/81;2/82;5/82	322	555	88
Powder River Round I	4/82;10/82	2,360	1,681	1,580
Fort Union[b] Round I	9/83	800-1,200	543	102[b]
San Juan[a] Round I	(1st quarter FY84)[c]	800-900	—	—
Green River-Hams Fork Round II	(2nd quarter FY84)[c]	750-950	—	—
Uinta-Southwestern Utah Round II	(2nd quarter FY84)[c]	1,600-2,100[a]	—	—
Powder River Round II	(4th quarter FY84)[c]	1,200-4,850	—	—
Fort Union	(4th quarter FY85)[c]	—	—	—

[a] In place reserves.

[b] Bid received, but not sold because of lease sale ban in fiscal year 1984 Interior Appropriations Bill.

[c] Original schedule, now deferred.

SOURCE: Office of Technology Assessment, from Bureau of Land Management documents.

have cut the time for field activities in support of land use and activity planning by as much as one-half in those regions (6).

Compression or acceleration of sale schedules also hinders other agencies' ability to coordinate their planning with BLM's. For example, in the Uinta region, the Forest Service planned to budget time and resources for their involvement in activity planning for anticipated Round II sale dates in fiscal years 1985-86. The sale dates were then moved forward 2 years (to 1983-84), but the Forest Service had not submitted budget requests for activity planning for those years. Although the Forest Service actively assisted BLM in keeping to the Bureau's schedule for Round I, they view the current hiatus in leasing as a chance to "catch up" on their land and resource management planning so they can participate more effectively in, and have the budget resources for, activity planning for Round II (10).

The reorganization that shifted DOI's minerals conservation functions from the Geological Survey (USGS) to the Minerals Management Service (MMS) and eventually to BLM was partially responsible for tract delineation being delayed in some of the regions. Also, time schedules were difficult to meet in some regions due to changes in policy directives to the field offices. All of these were compounded by personnel rotations and attrition in BLM field offices.

The Environmental Implications of Leasing Rates

High regional leasing rates—the combination of increased leasing levels and rigid lease sale schedules—mean that BLM must delineate and evaluate more tracts during activity planning and environmental impact assessment. If additional time and/or resources (including staff or funds) are not provided for these activities, then less data collection and analysis can be performed if the rate is maintained. As a result, more tracts must be carried forward with less analysis than might be desirable to assure environmental compatibility, and greater reliance must be placed on the permit review, which increases the risk that environmentally sensitive areas eventually will be mined.

In the last 3 years, high regional lease rates resulted in the application of some unsuitability criteria without sufficient supporting data and analyses, or the deferral of their application to activity planning (see discussion of "Unsuitability

Criteria" below). Thus, the deadline for completion of land use planning had to be allowed to slip, or time had to be taken during activity planning to complete some of the land use planning functions. Either way, the EIS preparation schedule remained fixed, and the time remaining for site-specific analyses (SSAs) had to be compressed. This was exacerbated by the need to collect data and complete the unsuitability reviews that were deferred during land use planning.

There is consensus among the participants in the leasing program that, unless lease sale schedules were allowed to slip, there was insufficient time to complete more than reconnaissance level studies, and, in some cases, for the appropriate technical experts (e.g., soil scientists, wildlife biologists) physically to visit a site pre-lease (Powder River) (10b). In at least one region (Uinta), the majority of time allotted for site-specific analyses was during the winter months (10c). In some split estate situations, obtaining surface owner consent for, and performing, data collection and research was difficult given the tight planning schedule.

Where leasing rates did not increase greatly, or where planning and analysis were begun sufficiently far in advance (e.g., mid-1970's), BLM generally was able to complete the additional planning and analysis necessitated by higher leasing rates. However, where leasing rates did increase significantly and BLM had not made sufficient progress in environmental assessment, local and regional BLM offices were forced into a crisis or issue management mode, in which they were able to focus only on tracts nominated by industry or about which controversy had arisen. The quality of their assessments suffered as a result. If it were not for the high leasing rates, BLM probably would not have had to strain its environmental planning and assessment capabilities. Furthermore, the postponement of land use decisions resulting from the high leasing rates heightened conflicts over specific tracts, which further exacerbated the ability to reach accommodation with the affected parties.

DATA AND ANALYSIS

Comprehensive land use and activity planning and environmental assessment supported by increasingly detailed data and analyses are at the heart of the tiered structure concept of the Federal coal leasing program. However, the adequacy of the data and analyses used in decisionmaking for some of the past Federal coal lease offerings and those currently being evaluated has been criticized, both in terms of quality and quantity, and in the timeliness of their availability. These criticisms currently form part of the basis for three lawsuits. In *Northern Cheyenne Tribe* v. *Watt* (16), and *National Wildlife Federation* v. *Burford* (14), plaintiffs allege that the land use plans which provided the foundation for environmental decisions in the first round of coal lease sales in the Powder River region do not meet the requirements of either FCLAA or FLPMA. A third suit, *Natural Resources Defense Council* v. *Burford* (15), challenges the adequacy of planning in all regions to the extent it is based on updated MFPs rather than new RMPs (see ch. 3).

This section describes the data-gathering process as it relates to the Federal coal leasing program. While both the theory of the existing legal and regulatory framework, and its implementation are addressed, the focus of the following discussion is the present practices of BLM in data collection and analysis, and the criticisms of those practices. Aspects of data and analysis that relate specifically to the application of the unsuitability criteria are addressed in detail in a separate section of this chapter.

A Tiered Process

Decisionmaking in the Federal coal management program is essentially a tiered process in which the level of detail in environmental analyses increases as the amount of land under consideration for leasing (and mine development) decreases (see fig. 2 in ch. 2). At the lowest tier is comprehensive land use planning for areas administered by Federal land management agencies. For the most part, the information at this level is prepared prior to the initiation of planning for the development of a particular Federal resource, but includes lands' acceptability for such development. Thus, land use planning in an area known to have recoverable Federal coal resources will include collection and analysis of coal resource data, application of the unsuitability criteria, evaluation of potential multiple-use tradeoffs, and surface owner consultation, as well as comprehensive land use planning for **all** resources based on principles of multiple use and sustained yield. These four "screens" for determining coal lands' acceptability for further consideration for leasing are described in greater detail in chapter 3.

The 1979 leasing program regulations specified that these four screens were to be applied sequentially, with medium to high coal development potential being the initial screen (compare figs. 10 and 11). Under the present program, the screens need not be applied sequentially (and, in practice, often are considered simultaneously), and lands with low coal development potential may also be carried forward to later stages as acceptable for further consideration for leasing and eventually offered for lease. Allowing lands with low coal development potential to be carried forward to the next stage of the leasing process can increase the area BLM field personnel must evaluate at each subsequent stage, which exacerbates the time and other resource constraints imposed by high leasing rates. This effect can be compounded by the simultaneous application of the screens if BLM's limited staff, time, and budget are expended collecting and analyzing data relevant to one screen only to find the area is unacceptable under another which would have been applied first under the 1979 program. On the other hand, an **inflexible** requirement for sequential application could be less efficient if, for example, data are available to drop an area from further consideration based on multiple-use tradeoffs, but that action could not be taken until data to support coal resource or unsuitability determinations are available.

Once the required screens have been applied, potential lease tracts are delineated and additional information about them is gathered and evaluated during activity planning for a regional lease sale. Data and analyses at this stage focus on the possible impacts that could result from development of an active coal mine on those tracts that have been found potentially acceptable for such development. During activity planning, environmental assessments include site-specific analyses, tract profiles, and the estimated regional impacts of development on lease tracts, which culminate in preparation of the regional lease sale EIS and the ranking of tracts by the RCTs.

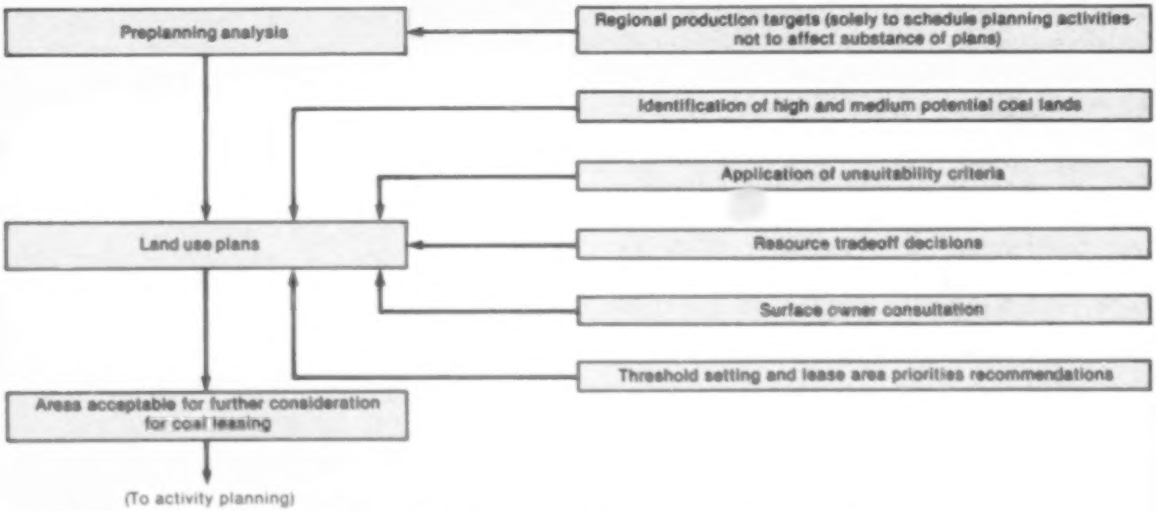
The ultimate level of detail in the assembled data and the scrutiny it receives is outside the actual leasing process. It is the submission, pursuant to SMCRA, of an application for a surface mining permit, including a detailed mining and reclamation plan, for a particular tract and scrutiny of that application by the appropriate permitting agency. The extremely detailed data and analyses required at mine plan review shift the economic burden of gathering extensive inventory data and performing data intensive analyses (e.g., on hydrology or reclaimability) to the lessee.

At each step in this process, existing data are analyzed in increasing detail and supplemented by more directed data-gathering efforts. This is possible because the amount of land being evaluated at each successive tier becomes progressively smaller as the land moves closer to actual development. The intent of this tiered process is not only to permit a progressively narrower focus of the evaluations, but also to eliminate unacceptable areas from further consideration for leasing, after taking into account the coal resource quality and quantity, proximity to existing transportation, socioeconomic and environmental concerns, and other factors.

Sources of Data

A variety of different types of data and analyses are necessary to support land use and activity planning and environmental assessment for

Figure 10.—1979 Land Use Planning Process


Preplanning analysis
Regional production targets (solely to schedule planning activities-not to affect substance of plans)
Identification of high and medium potential coal lands
Application of unsuitability criteria
Land use plans
Resource tradeoff decisions
Surface owner consultation
Threshold setting and lease area priorities recommendations
Areas acceptable for further consideration for coal leasing
(To activity planning)

SOURCE: Bureau of Land Management, Federal Coal Management Program, Final Environmental Statement (April 1979).

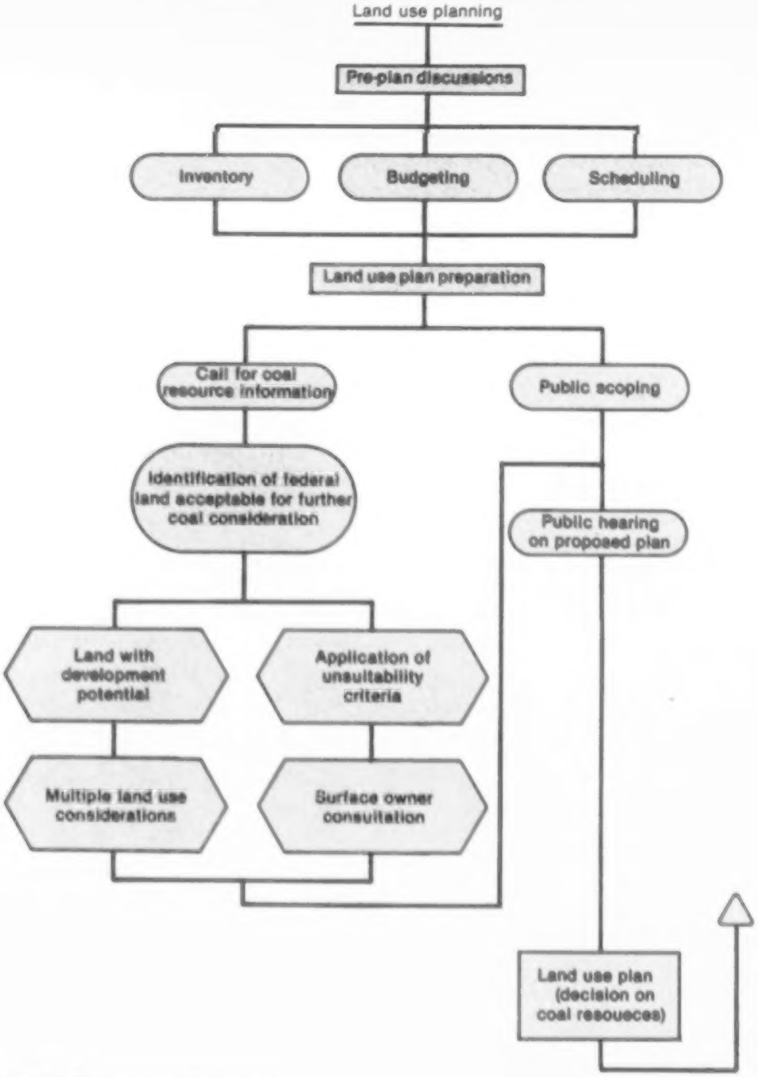
coal leasing. These include coal resource data, other resource inventories (e.g., hydrology, wildlife and habitat, cultural and archaeological sites), socioeconomic data, and environmental, social, and economic impact assessments. The sources for such supporting information include earlier BLM planning documents, BLM field studies, other Federal and State agencies, local communities and residents, coal companies, mine plans and operating mines, the public, academe, and environmental and other interest groups. However, the data available from these sources are not readily accessible in any systematic way, and the extent to which these sources are tapped varies widely.

Data and analyses developed by BLM (i.e., available in-house) are based on general land use planning, and on field studies and planning in support of earlier lease sales or other activities (e.g., grazing, wilderness). All BLM regions have MFPs to guide their planning. However, such plans were prepared prior to the comprehensive land use planning mandates of FCLAA and FLPMA, and must be amended or updated to incorporate planning for coal leasing. The continued reliance on updated MFPs contributes to the perceived inadequacy of BLM's data and planning and is one basis for the pending litigation against BLM by environmental groups. The preparation of comprehensive RMPs is underway in some areas, but those documents generally will not be available to support leasing activity until at least the third round of lease sales (see separate discussion of RMPs in ch. 3).

In the current leasing process, MFPs are supplemented by field studies to the extent possible. It appears that BLM has not been able to collect as much data or perform as many analyses as they would have liked. In general, funds for new resource inventories have been cut back, and environmental assessments typically relied on updates of existing inventories based on areal mapping.

The fiscal year 1984 budget justification indicates that the Bureau plans to reduce the number of technical investigations by more than one-half (see table 7) (1). Technical investigations are studies describing the effects of coal leasing decisions on hydrology, overburden, soils, and vegetation. Under a 1981 policy change, the responsibility for overburden, soil, and revegetation studies has been transferred to lessees. According to that budget justification, BLM considers hydrologic studies necessary to support decisions leading up to a lease offering and will continue to perform such studies in-house, but with a

Figure 11.—Current Land Use Planning Process


Land use planning
Pre-plan discussions
Inventory
Budgeting
Scheduling
Land use plan preparation
Call for coal resource information
Public scoping
Identification of federal land acceptable for further coal consideration
Public hearing on proposed plan
Land with development potential
Application of unsuitability criteria
Multiple land use considerations
Surface owner consultation
Land use plan (decision on coal resouces)

SOURCE: Bureau of Land Management.

greater reliance on existing data from earlier studies in the same areas and on data from lessees (1).

DOI also plans to cut nonminerals inventories by one-third, primarily by concentrating inventories in areas with high coal development potential, and to reduce geology, energy and minerals (GEM) assessments by more than one-half by shifting from a tract-by-tract analysis of coal resources to an automated data base incorporating industry drilling and other data (1). Finally, land use planning studies to support regional lease sales, which provide information on specific topics such as air and water quality, cultural resources, and socioeconomic impacts will be reduced by more than one-half. This reflects anticipated decreases in the number of lease sales

Table 7.—BLM Coal Leasing Workload Projection

Workload measure	FY 1982 actual	FY 1983 appropriations	FY 1984 base	Change: FY83 appropriations to FY84 base	FY 1984 estimate	Change: FY84 base to FY84 estimate
Activity plans prepared	3	4	5	+1	5	—
PRLAs processed	53	80	80	—	69	−11
Lease readjustments	52	40	65	+25	65	—
MFP amendments	6	2	4	+2	4	—
Land-use planning studies	14	13	13	—	6	−7
Inventory (000 acres)	615	2,100	2,100	—	1,400	−700
GEM assessments (000 acres)	120	300	708	+408	322	−386
Lease applications	23	23	23	—	23	—
Exploration licenses	74	78	78	—	78	—
Trespass investigations	6	5	8	+3	8	—
Site-specific EAs	58	43	67	+24	67	—
Site-specific EISs	1	7	7	—	5	−2
Technical investigations	36	13	13	—	6	−7
Lease assignments	56	59	95	+36	95	—
Negotiated sales	4	3	2	−1	2	—
Lease modifications	12	7	5	−2	5	—
Lease exchanges	6	7	7	—	7	—
Unsuitability petitions	—	1	2	+1	2	—
Conveyances	15	20	20	—	10	−10
Tracts evaluated for regional lease sales	65	65	65	—	35	−30
Tracts evaluated for application lease sales	30	10	10	—	5	−5
Diligent development/continued operations determinations	130	134	134	—	134	—
Inspections	1,800	2,200	2,200	—	2,400	+200
Mine and exploration plan reviews	268	259	259	—	269	+10

SOURCE: Bureau of Land Management FY84 Appropriations Summary Statement.

to be conducted in fiscal year 1985 and fiscal year 1986, as well as greater reliance on lessee data on cultural resources (1).

These reductions in the basic analyses that support land use planning assume that the existing planning base will be adequate, with tract-specific amendments, to make informed decisions about the environmental compatibility of tracts to be offered in future lease sales. Since OTA found that current pre-sale planning and analyses have not always been adequate in the past, continued cutbacks in these activities in the future can only heighten the controversy. The changes in program emphasis described above also focus most general planning and analysis on areas with coal development potential. As a result, the planning data base will continue to fall short of a comprehensive areal perspective on the relative values of resources on coal tracts.

The collection of coal resource information by industry or Federal agencies, including BLM and USGS, occurs both independently of and as an important part of the leasing program. However, the Federal coal drilling program has been suspended and leasing decisions related to coal development potential are increasingly dependent on industry data. Coal companies must submit coal resource information in support of expressions of interest for particular tracts. Otherwise, coal resource information is proprietary and does not have to be shared with BLM or disclosed to the public. As discussed below, other data developed by industry (e.g., on environmental resources) also can be considered proprietary and do not have to be given to BLM pre-lease.

One possible source of data on hydrology and soil profiles is from industry drilling to collect coal resource information. A company must secure a drilling permit from BLM in order to perform the exploratory drilling necessary to evaluate an area's coal development potential. These permits could be conditioned to require the simultaneous collection of hydrological and soil profile data, or BLM could perform additional data collection at those sites at minimal cost to the government.

In the Wyoming portion of the Powder River region, exploration licensees have been encouraged to gather as much environmental data as possible (6), but otherwise opportunities to take advantage of industry drilling activities to secure additional environmental data seem to have been overlooked.

One source of high quality environmental resource information that frequently is not used by BLM is data from **mine plans and operating mines.** While these data do not apply directly to any lands considered for coal leasing, they are sometimes derived from lands either adjacent to or in the vicinity of potential lease tracts. Consequently, they can provide extremely detailed information that identifies the characteristics of and impacts of mining in areas similar to proposed lease tracts. This information can then be verified by, or used to focus, data gathering efforts on lease tracts.

Unlike industry data gathered on unleased areas, all information in mine plans, including in-depth analyses, and from operating mines, is available to the general public. However, one potential problem in the use of existing mine plan and mining data is the extreme site specificity of the information. For example, revegetation data in the San Juan region do not address reclamation in a systematic regional manner, but at a mine-specific level (10a). A second problem is that the sheer scope of a mine plan, which may number 20 or 30 volumes, discourages the use of these data and analyses. Nevertheless, concern was voiced to OTA in each region about the extent to which data from existing mine plans and operating mines were not utilized by BLM.

Apart from the Federal surface management agencies, including BLM and the Forest Service, **a large group of technical expertise** exists within the mining industry, OSM, State and local governments, BIA, Indian Tribes, academe, and the general public. Technical expertise from virtually all of the sources mentioned above has contributed to BLM's land use and activity planning and environmental assessment. For example, active participation by local residents in BLM's pre-lease planning and assessment resulted in identification of valuable wildlife habitat in Powder River (10b). However, in other cases, BLM made minimal use of technical expertise that was not available in-house.

BLM is beginning to make more use of data from outside sources. For instance, in the San Juan region, early planning documents for leasing acknowledged the lack of data on socioeconomic, agricultural, and cultural characteristics of Indian lands. Many of the gaps could be filled by BIA and the Tribal and Pueblo governments. BLM is now attempting to incorporate information from these sources in their pre-sale planning (10a). Similarly, in Colorado, BLM has now contacted the Mined Land Reclamation Division of the State Department of Natural Resources to determine how State data bases derived from permitting and monitoring of mines can be used in pre-lease planning (6).

The primary constraint on the use of data from sources outside BLM is the limited period of time and other resources available to seek out such data coupled wth the lack of a comprehensive, easily accessible data base. Due to the time and budget constraints on **all** participants in leasing, available information is not easy to incorporate in pre-lease planning and analysis. BLM has neither the time nor the resources to review all existent data—most of which is unpublished and thus not indexed—for its relevance to leasing. Similarly, it is usually beyond the scope of other participants' resources (or responsibilities) to ensure that all information applicable to leasing is presented to BLM in a manner that would facilitate leasing decisions. As a result, the exchange of information among participants in leasing has been somewhat serendipitous.

Attempts have been made in the past to accumulate all resource data and analyses relevant to Western coal development and incorporate them in a comprehensive, easily accessible, computerized data base. Such a data base would be invaluable in improving the quality of pre-lease planning and assessment, in assisting in reclamation plans, and in facilitating public participation in leasing and mine plan review. However, it would also be an extremely expensive and time-consuming task. BLM currently is developing a computerized data base on coal resources; it could be expanded to include other resource data. The U.S. Forest Service formerly published a quarterly computerized listing of reclamation studies that were available in the Rocky Mountain West—*Surface, Environment, and Mining (SEAM)*—which was discontinued for financial reasons. Options for developing such a data base are discussed in more detail in chapter 2.

Adequacy of Data and Analyses

The data and analyses for assessing the environmental compatibility of coal development on potential Federal lease tracts raise issues related to the ability of data bases to support leasing decisions during land use and activity planning, high leasing rates, the insufficient guidelines or standards for evaluating the adequacy of data and planning, reliance on "worst-case" analysis, the elimination of requirements for cumulative impact assessments prior to the EIS, problems with data collection on split estate lands, and the constraints on use of non-BLM data (discussed previously).

It should be noted at the outset that the quantity and quality of data and analyses needed to support a particular planning or leasing decision frequently is a "judgment call." Seldom will there be a consensus among participants in the leasing process that there is an appropriate level of information for a decision; some will always argue "too little," others will always counter "too much." However, the factors discussed below support the finding that BLM personnel were not, in many cases, able to meet their own professional standards for the quality and quantity of data and analysis desirable to support land use and activity planning.

Land Use Planning

OTA found that in some cases, an outstanding job of data collection and analysis was performed to support informed land use planning decisions. For example, in the Powder River region, the MFP and amendments for the Decker-Birney area, in the vicinity of the Tongue River, indicate that extensive data of high quality existed to support land use planning. Often, the exceptional amount of data available in a particular area can be attributed to that area having been used for special studies during development of the leasing program. Unfortunately, the amount and quality of information in such areas appears to be an exception.

Inadequate data and analyses to support land use planning decisions were identified by OTA in two main areas: information to support application of the unsuitability criteria (discussed separately in this chapter) and coal resource data. Unless inadequacies in coal resource information and environmental data bases in the initial phases of the leasing process are explicitly recognized and subsequently remedied, they can affect the overall quality of land use and activity planning efforts.

In the San Juan region, for example, BLM had limited coal resource information early in land use planning. This was due in part to the unexpectedly high regional leasing level, which meant a larger area would have to be evaluated for coal resources than originally anticipated by BLM field personnel, and in part to the lack of an active drilling program within DOI. The guidance given by the RCT was to delineate more tracts on the basis of less reliable reserve information, with the caveat that the tracts would not be offered for lease until additional drilling was performed. Thus, adequate coal resource information may not have been available to the tract analysis team early enough for tract ranking.

This was one factor in the widespread criticism of the adequacy of the first draft EIS for the San Juan Round I lease sale (nonconsideration of PRLAs except in the no-action alternative, inadequate data on cultural resources, inadequate analysis of economic costs and benefits of leasing, no analysis of impacts of relocating Navajos, and inadequate hydrologic data were other factors). Following improvement of the coal resource information, gathering of more environmental data, particularly on cultural resources, and the lowering of the regional leasing level, a second draft EIS was prepared. However, of the 39 tracts carried forward for further consideration for leasing in the second draft EIS, 12 still are listed as "low confidence in the quality and quantity of the coal resource" (7).

OTA's perception is that the routine, everyday inventorying by BLM—data gathering that supports *all* activities and not just the coal leasing program—also has been inadequate to support environmental decisions on coal leasing. Budget constraints on resource inventorying (e.g., of wildlife habitat) during land use planning have led to a high degree of reliance on available data, primarily on updated or amended MFPs. As noted above, in a number of instances continued reliance on MFPs has been inadequate to support informed decisions most notably in the repeated deferral of application of the unsuitability criteria during land use planning (see separate discussions of the unsuitability criteria and of deferral of decisions).

In the Uinta-Southwestern Utah coal region, adequacy of existing comprehensive land use plans is a major issue. The specific concerns there are the conflicts between the schedule for land use planning by the U.S. Forest Service (as the surface management agency for National Forest lands) and that of BLM (as manager of the coal resources underlying Forest lands), and the disagreement between the two agencies on the significance of projected impacts of coal development. The Forest Service (and many other participants in leasing in that region) contends that potential cumulative environmental effects of leasing on the Manti-LaSal National Forest, in which numerous tracts have been delineated, cannot be assessed until a revised and updated Forest Land and Resource Management Plan is prepared, as required by the National Forest Management Act (see fig. 12). That plan is scheduled for completion in 1985, but was not available to support leasing decisions for the first round of sales (10).

Forest Service personnel cited data deficiencies concerning big game winter range, trout fisheries, sage grouse habitats, eagle nests, endangered species, flood plains, cultural resources, and other areas in the application of the unsuitability criteria and in preparation of the site-specific analyses. The limited time allotted for SSAs and the inconsistent approaches used by the two surface management agencies also were cited by Forest Service staff as reasons to delay leasing of certain tracts within the Forest (10). Other participants agree that there has been a lack of coordination in data collection and planning between the two agencies. For example, the two agencies have not as yet agreed to a definition of what constitutes a municipal watershed. This has implications for unsuitability criterion #17 (municipal watersheds), which, if it is found to apply, could remove much of the area from further consideration for leasing (see section on unsuitability criteria).

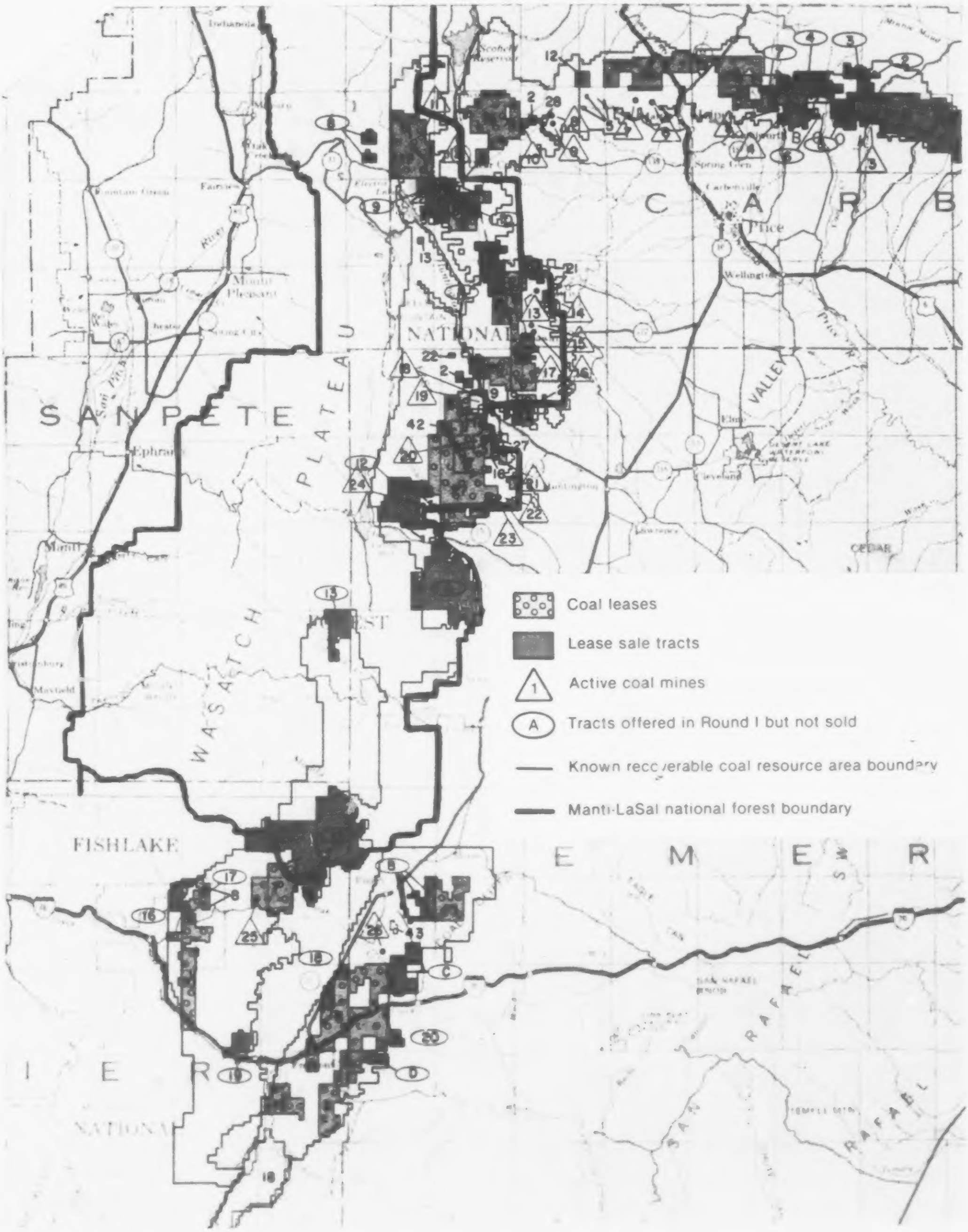
In the San Juan region, inadequate environmental data from MFPs and other sources were employed throughout land use planning, activity planning, and draft EIS preparation. The EIS process, rather than land use planning as prescribed in regulations, ultimately was responsible for forcing the collection of data, but this meant the data were collected after tract delineation, and were not incorporated at the outset in comprehensive land use planning.

As noted above, one of the possible means of improving data bases is to use data from sources outside BLM to make decisions concerning multiple-use tradeoffs and unsuitability decisions. In some cases, critical data that were available during land use planning were not considered, not only in land use planning, but also in later phases. For example, in the Fort Union region sufficient information was supplied to BLM at the outset of land use planning to enable them to make multiple-use tradeoffs or unsuitability decisions, and thus to drop tracts, due to the presence of missile silos and related control facilities. Yet these tracts were considered "acceptable pending study" (a Strategic Air Command assessment of the effects of mining on defense installations), and proceeded through planning and the EIS process before being dropped in the SID at the request of the Secretary of the Air Force because the final results of the study were not available (18).

Activity Planning

Data-gathering efforts during activity planning are focused on the specific delineated tracts. From this point on, the baseline data are used to analyze the projected environmental impacts of coal development on that particular site. Data

Figure 12.—Coal Tracts in the Manti-LaSal National Forest
(Uinta-Southwestern Utah coal region)


Coal leases
Lease sale tracts
Active coal mines
Tracts offered in Round I but not sold
Known recoverable coal resource area boundary
Manti-LaSal national forest boundary
SANPETE
CARBON
EMERY
SEVIER
WASATCH
PLATEAU
NATIONAL
FOREST
FISHLAKE
NATIONAL
SAN RAFAEL
VALLEY
Price
Wellington
Ephraim
Manti
Huntington
Cleveland
Elmo
Spring City
Mount Pleasant
Fairview
Indianola
Scofield Reservoir
Helper
Castle Dale
Ferron
Emery
CEDAR

SOURCE: Bureau of Land Management

collection that occurs once tracts have been delineated has been at best uneven. Specific problems include the lack of a regional perspective, variations in quality and quantity of data between tracts and between regions, and the difficulties posed by very large tracts.

One problem found by OTA is that the in-depth information on a given tract that supports the analysis in a regional EIS will not provide **a perspective on how the tract fits into the regional setting** unless information of an equivalent level of detail is available on areas throughout the region. On one hand, this means that detailed information on a tract can make it appear to be sensitive to environmental conflicts, whereas if considered in the context of equally detailed data for the entire region, the resources on that tract might not be valued so highly. This may be a contributing factor to industry's general reluctance to divulge environmental data on a tract in which they are interested. On the other hand, tract-specific data may be inadequate to support the assessment of cumulative impacts required in the EIS.

BLM field staff told OTA that tracts are far more likely to be dropped because of too much information rather than too little. For example, in the Powder River region, a tract was dropped from further consideration for leasing in Round II because of a preponderance of negative elements. It was not dropped explicitly because of application of any of the screening procedures. It simply seemed like a bad tract to lease when compared with other tracts (10b). While this is exactly the type of decision that BLM is supposed to make, it is possible that the level of data gathered on this tract tended to make it look worse than it would have appeared had an equivalent level of information been available for the general area. On the other hand, the comparison of equivalent data bases still might have justified not only the tract's low ranking, but also its being dropped from further consideration for leasing.

Criticisms also have been raised about **the lack of tract-to-tract consistency** in BLM's data bases. Among the examples cited are differences in the level of soil surveys and wildlife inventories that were available in some of the States. In the Powder River region, existing soil surveys in Montana were reportedly more detailed than those available in Wyoming (6). Similarly, in Fort Union, the Montana wildlife inventories were considered to provide higher quality information than those in North Dakota (9). In most such cases, the variations in data quality and quantity can be traced to staff support from State or other Federal agencies. Where resources are not available for that staff support, the quality of BLM's analyses suffers.

Regional variations in data adequacy also might be traced to the level of coal development in a region in the past, and therefore the availability of data from mine plans and operating mines, and the degree to which future coal development was anticipated. If a region plans for a low level of leasing and a high level is imposed, a large number of tracts will have to be evaluated in a short period of time, usually after land use planning. Inconsistencies such as these further underscore the present lack of any program-wide guidelines to assist in the assessment of the quality of data desirable at each stage of lease planning.

Gathering environmental data on **very large tracts** may be a significant problem for informed decisionmaking. For example, the Ash Creek tract in Powder River is over 7,700 acres in size. Only the most comprehensive site-specific analysis and inventory of resources could ensure that all environmental resources are considered adequately on such a tract. In such situations, time and budget constraints mean BLM must rely on other participants to alert the Bureau to environmental conflicts. Thus, on Ash Creek, the presence of one of two known nesting sites within Wyoming of a State high interest species, the Lewis Woodpecker, was ascertained only as a result of the active participation of local residents in activity planning. Determination of this species' presence on the tract resulted in BLM's declaring a buffer zone around the nesting site as unsuitable for mining. However, subsequent BLM data collection indicated the presence of alluvial valley floors and bald eagle hunting grounds, and Ash Creek was not carried forward in the regional EIS (10b).

Policy Implications

OTA found that the primary cause of data inadequacy in recent years has been *the high leasing rates,* or the combination of the size of the area that must be evaluated for leasing at each stage of the process, and the amount of time allotted to that evaluation. The high leasing rates did not provide sufficient time for BLM personnel to search existing data bases or to collect new data in areas that had not previously been inventoried or had been inventoried only partially. As a result, either the time needed for land use planning had to be extended and, therefore, the activity planning schedule compressed, or land use planning decisions had to be deferred or based on inadequate data (see separate discussion of "Regional Leasing Rates"). Deferral of data collection to activity planning—after tracts have been delineated—may result in BLM overlooking potential coal lease tracts.

Another major problem with the current Federal coal leasing program is the **insufficient regulatory guidelines and standards** for determining whether the environmental data that exist at any stage of the leasing process, either during land use or activity planning, are adequate to proceed to subsequent stages. Some guidelines are specified in internal BLM memoranda and other directives, but most **regulatory** standards for data adequacy were eliminated in the 1982 program changes. A wide range of participants in the leasing program—including many BLM field personnel—expressed a preference for regulatory standards and guidelines (when written with sufficient flexibility to adapt to regional needs) because they provide more predictability and stability in leasing decisions, and facilitate more effective public participation.

Moreover, there is no uniform interstate or interregional approach to a "checklist" for the minimal requirements of a data-gathering effort for different stages of pre-lease planning and assessment or for different field disciplines. Guidelines do exist for preparation of the regional lease sale EIS, in the explicit requirements set out in NEPA and the CEQ implementing regulations, but the precise levels of data needed for an evaluation are not specified by scientific disciplines.

The importance of an adequate data base to support leasing decisions was expressed in the 1979 regulations implementing the Federal coal management program. Yet, provisions of the 1979 regulations concerning general requirements for the adequacy of data in land use planning were eliminated in 1982. There also appear to be no guidelines in the regulations as to the specific quality or quantity of data related to specific disciplines (e.g., hydrology, wildlife) that are needed to make the required environmental reviews and decisions. BLM currently is revising its internal manual for land use planning; a final version which might include such guidelines should be available in mid-1984. However, as noted above, internal guidelines may not be as effective in providing guidance to field personnel, do not provide as much predictability and stability, are not subject to formal public review and comment, and are not as accessible to the public as regulatory guidelines and standards.

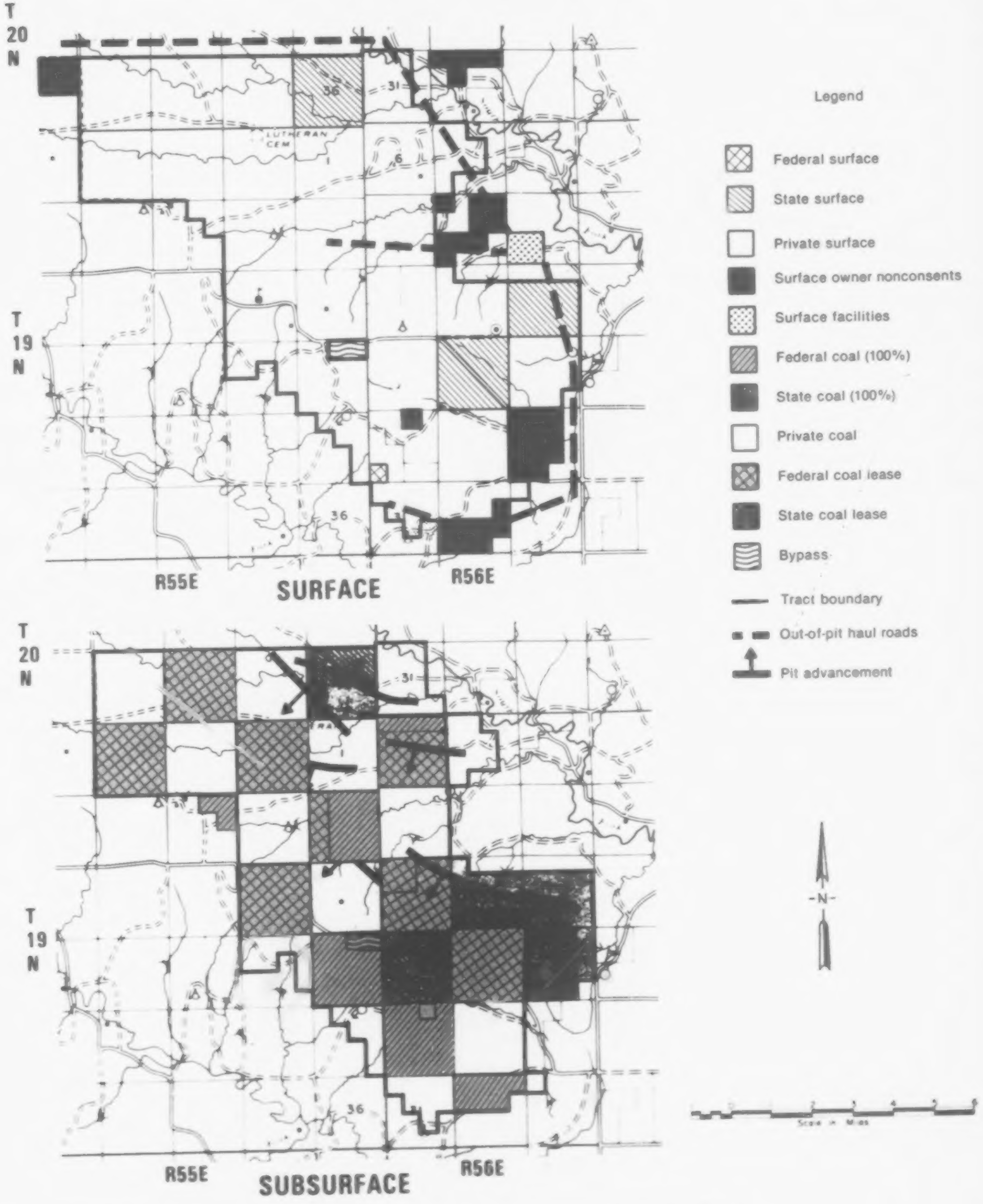
One option that might provide greater guidance is a scaled indexing scheme for each scientific discipline for which the data base must be evaluated at different stages of the coal program (e.g., soil orders 1 through 4, cultural resource inventory classes 1 through 3). At each stage, a specific level within the scaled indexing scheme could be required to be attained before the area could advance to the next planning stage. For example, while a class 1 cultural resource survey (a survey of all the relevant literature, published and unpublished, on cultural resources in the area) may be sufficient to make informed land use decisions, a class 3 survey (100 percent field recognizance) may be required in the mine plan to support a permit application in areas where cultural resource sites are numerous. Other scaled indexing systems could be devised for each of the scientific disciplines that need to be addressed. The scales must be flexible enough to accommodate the wide variation in resources and available data among tracts and regions; they should not be "cookbook" standards. Moreover, such standards and guidelines must ensure that the levels of data and analysis are technically and economically feasible and correct for the stage in the tiered leasing process in which a particular decision is to be made.

Another criticism of the methodologies used to analyze environmental impacts is directed at **the "worst-case" approach to environmental impact assessment,** which is required by the Council on Environmental Quality (CEQ) regulations whenever "information relevant to adverse impacts is essential to a reasoned choice among alternatives and is not known and the overall costs of obtaining it are exhorbitant" (40 C.F.R. 1502.22). First, concerns have been raised that worst-case analysis bears no relation to reality in that no coal company would develop a mine similar to that described in a worst-case analysis. In fact, in most cases a mining methodology cannot be projected accurately for any tract prior to permit application review, when in-depth coal resource and environmental inventory data are available for a tract. Even then, industry doubts that two mining engineers would develop the same mine plan. Yet, the leasing program must contend with tracts being ranked and ultimately recommended for leasing on the basis of impact analyses predicated on worst case development of a tract. Second, if an extreme worst case analysis is used for **regional** development, it can be counterproductive in that it unduly alarms (or raises the expectations of) the public and inhibits the ability of local communities to plan for development. However, worst-case analyses can provide a sense of the potential **risks** posed by leasing decisions when adequate data or methodologies are not available to quantify likely costs and benefits of a proposed action.

Major concerns also have been raised about the recent elimination of **the threshold concept of cumulative impacts** as regulatory authority to drop a tract from further consideration for leasing prior to the EIS. The threshold concept originally was intended to serve as a quantitative measure of the projected combined impacts of the development of several mines in one area being evaluated for leasing during one round of lease sales. In the 1979 regulations, BLM was specifically empowered to halt, suspend, or condition further consideration of areas for leasing during land use planning if analysis indicated that a threshold level of cumulative impacts would be reached. Similar regulatory authority was granted to the RCTs during tract ranking. These authorities were eliminated in the 1982 regulations, which use the threshold concept only in a very general sense as a measure of cumulative impacts in the EIS. BLM indicates that the threshold concept was not well understood and had never been used (6). Development of a workable threshold concept and its implementation through the program regulations (including authority to drop tracts or condition their further consideration for leasing) during land use planning and tract ranking would address one of the perceived inadequacies in BLM's pre-lease planning and assessment and would reduce the risk of adverse environmental impacts from the development of several mines in one area.

Finally, **split estate lands** can inhibit BLM's ability to collect sufficient data to support land use and activity planning decisions and to prepare the EIS. BLM personnel are not assured access to such lands for data collection and field studies. For example, in the Fort Union region, the Burns Creek tract (see fig. 13) had to be eliminated from further consideration for leasing due to lack of data because surface owners denied BLM access to the land for the collection of baseline data (4). Although the tract had been in the planning process for nearly 2 years, surface owners had previously granted a mining company access to the land so that they could collect environmental baseline data. They did not perceive a need for a second stint of inventorying, but the company, which viewed the environmental data it had gathered as proprietary, declined to share the data with BLM, and the tract could not be evaluated for environmental compatibility. The uncertainties posed by planning and assessment for, and leasing of, split estate lands are discussed in greater detail in a subsequent section of this chapter.

Figure 13.—Burns Creek Tract


T
20
N
36
31
LUTHERAN CEM
1
6
T
19
N
36
R55E
SURFACE
R56E
Legend
Federal surface
State surface
Private surface
Surface owner nonconsents
Surface facilities
Federal coal (100%)
State coal (100%)
Private coal
Federal coal lease
State coal lease
Bypass
Tract boundary
Out-of-pit haul roads
Pit advancement
T
20
N
31
T
19
N
36
R55E
SUBSURFACE
R56E
-N-
0
1
2
3
4
5
6
Scale in Miles

SOURCE: Bureau of Land Management, *Fort Union Coal Region Draft Environmental Impact Statement* (July 1982).

UNSUITABILITY CRITERIA

As discussed in chapter 3, 20 unsuitability criteria have been developed to implement the Surface Mining Control and Reclamation Act (SMCRA), other Federal laws, and executive orders (see table 8). The principal objective in applying these criteria is to protect the most sensitive and valuable features of Federal lands, and to determine whether such lands contain areas which are unsuitable for all, or certain types of, surface coal mining operations. The unsuitability criteria can be divided into three categories: 1) those criteria that are mandated or suggested under section 522 of SMCRA, 2) those that embody requirements under other Federal statutes which DOI chose to enforce through the unsuitability criteria, and 3) some that DOI selected on the basis of its judgment of their merits.

As required in the regulations implementing the leasing program, these unsuitability criteria are initially applied to all Federal coal lands with development potential during land-use planning or during the environmental assessment conducted for preference right lease applications. Additional unsuitability analyses may be conducted during activity planning (particularly for lands that were found to be "acceptable pending further study" during land use planning). For areas where one or more unsuitability conditions are found, but otherwise BLM continues to regard coal mining as a likely use, the exceptions and exemptions to each applicable criterion may be applied (see ch. 3). The land use plan must describe the results of applying the unsuitability criteria, and must state which areas could be offered for lease only subject to conditions or stipulations needed to bring them into conformity with the relevant criterion. Such areas may ultimately be leased provided that these conditions or stipulations are contained in the lease.

Specific exceptions and exemptions to the unsuitability criteria, relating principally to acceptable mitigation, valid existing rights, and substantial financial and legal commitments are provided in the regulations. The unsuitability criteria are not required to be applied to Federal lands which will be mined by underground methods unless such mining will produce surface effects to which a criterion applies.

Table 8.—The Unsuitability Criteria

1. Lands in the Federal land preservation system (e.g., National Parks, Wildlife Refuges, Trails, Wild and Scenic Rivers, Recreation Areas, Wilderness Areas)
2. Lands within rights-of-way or easements
3. Lands within 100 feet of cemeteries and rights-of-way for public roads, or within 300 feet of public and residential buildings
4. Wilderness study areas, while under review for wilderness designation
5. Class I scenic areas
6. Lands used for scientific studies involving food or fiber production, natural resources, or technology demonstrations and experiments
7. Publicly owned places on Federal lands which are listed on the National Register of Historic Places
8. Lands designated as natural areas or as National Natural Landmarks
9. Federally designated critical or essential habitat for threatened or endangered plant and animal species
10. Lands containing habitat considered critical or essential for State-designated threatened or endangered plant and animal species
11. Bald or golden eagle nests or sites, including appropriate buffer zones that consider habitat for prey species
12. Bald and golden eagle roost and concentration areas used during migration and wintering
13. Falcon cliff nesting sites and appropriate buffer zones that consider prey species' habitat
14. High-priority habitat for migratory bird species of high Federal interest on a regional or national basis
15. Essential habitat for resident fish and wildlife species of high interest to the State (e.g., active dancing and strutting grounds for sage grouse, sharp-tailed grouse, and prairie chicken; critical winter ranges for deer, antelope, and elk; and migration corridors for elk)
16. Lands in riverine, coastal, and special flood plains (100-year recurrence)
17. Lands committed by the surface management agency to use as municipal watersheds
18. Natural resource waters identified in State water quality management plans and a buffer zone of one-quarter mile from the outer edge of the far banks of the waters
19. Alluvial valley floors (AVFs) considered important for agriculture, or land outside an AVF if mining would materially damage surface or underground water systems that supply the AVF
20. Lands deemed unsuitable by criteria proposed by a State and adopted by the Secretary of the Interior in rulemaking.

SOURCE: 43 CFR 3461.1.

Application of Unsuitability Criteria

In the leasing efforts associated with the five coal regions studied in this assessment, the unsuitability criteria were applied during both land use planning and activity planning. Based on areas in these regions which passed the coal development potential screen, the case studies indicate that an average of approximately 3 to 12 percent of these areas were found to be unsuitable for mining (see case studies in vol. II). However, it was not always possible to determine how much coal was removed from further consideration for leasing due to application of the unsuitability criteria. MFP updates or amendments usually give acreages or tonnages affected by preliminary application of the criteria during land use planning (see table 9). However, those acreages/tonnages frequently change during activity planning but new figures are not included in tract summaries or EISs. Application of the exceptions or exemptions to the criteria further cloud the issue, and make it still more difficult to determine exactly how much coal was excluded from development due to the criteria. For example in Fort Union, the MFPs indicate that exceptions apply to each of the relevant criteria, and in virtually all instances, specify that actual decisions will be made later in the process (e.g., "Until it is successfully demonstrated that these ecosystems [wooded draws] can be restored, they will be protected by exclusion from mining") (8). In practice, such decisions usually are deferred to mine plan review. It is clear, however, that BLM relies more heavily on the unsuitability analysis than other means of excluding coal lands from leasing, such as the multiple-use screen.

Analysis of the application of the unsuitability criteria in the five Western coal leasing regions shows that, in general, those criteria which relate to features capable of being defined by lines on a map were applied most easily and consistently (see fig. 14). These criteria include:

#1. Special Federal lands (parks, trails, refuges, etc.);
#2. Rights-of-way;
#3. Lands adjacent to cemeteries, public buildings, or roads;
#4. Wilderness study areas;
#6. Scientific study areas; and
#8. Natural areas and national landmarks.

Although the above criteria have been the easiest to apply, they have not been without controversy. For example, in San Juan, the presence of Navajo grave sites on tracts has not led to unsuitability determinations under criterion #6, nor has the congressional approval of a National Continental Divide Scenic Trail led to unsuitability findings under criterion #1. The second draft EIS for the San Juan River region projects impacts to recreation on the Trail, including safety hazards, disruption of the trail location, and impairment of esthetics (from utility corridors, noise, dust, etc.). That EIS notes:

> Portions of the Continental Divide National Scenic Trail study corridor [are] routed through or adjacent to the Star Lake West #2, Gallo Wash #1, Hospah #1, Star Lake #1 or Johnson Trading Post Tracts. The actual treadway for the Continental Divide National Scenic Trail has not been established. In view of this situation, [criterion #1] does not require the proposed study corridor to be designated as unsuitable for surface coal mining (7).

The basic study route for the Trail is 30 miles wide and there is a zone of concern 50 miles wide on either side of the Continental Divide (see

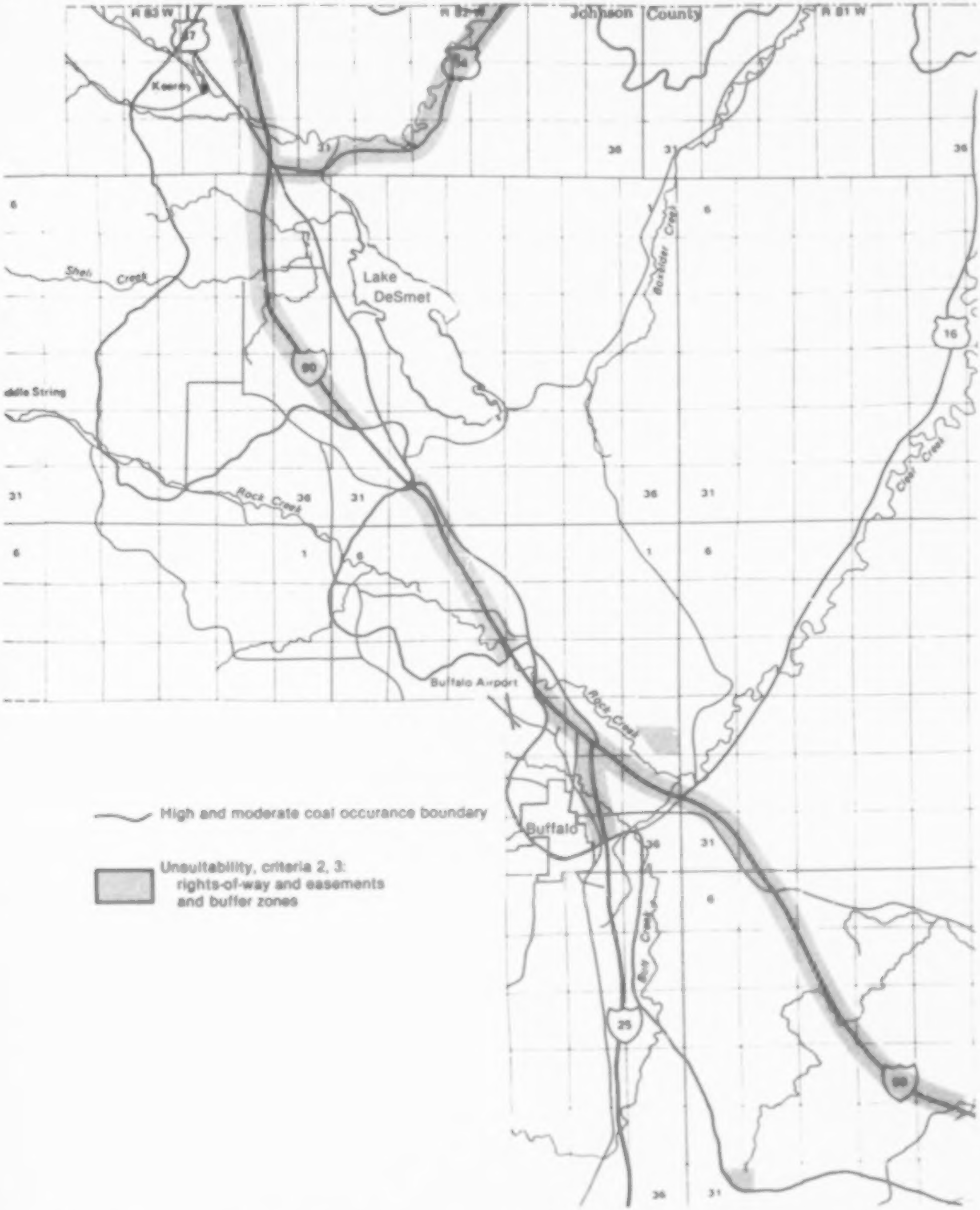
Table 9.—Areas Screened Out During Land Use Planning for Round I in Western Powder River Basin Due to Unsuitability Criteria or Multiple-Use Tradeoffs

			PRLAs	
	Acres	Million tons	Acres	Million tons
High and moderate coal	464,894	16,612.2	N/A	N/A
Non-Federal and committed Federal	−195,453	−7,635.4	N/A	N/A
Available for application of unsuitability criteria	269,441	8,976.8	53,335	307.7
Unsuitable	−3,571	−128.7	0	0
Available for multiple-use analysis	265,870	8,848.1	N/A	N/A
Eliminated by multiple-use analysis	−5,108	−194.9	N/A	N/A
Acceptable for further consideration[a]	260,752	8,653.3	53,335	307.7

[a] Includes areas found acceptable and acceptable pending study.

SOURCE: Bureau of Land Management, *Proposed Coal Amendment to Wyoming Land Use Decisions, Western Powder River Basin Area*, 1981

Figure 14.—Example of Application of Unsuitability Criteria #2 and #3 in Western Powder River Basin Area


R 83 W
R 82 W
Johnson County
R 81 W
87
16
Kearny
31
36
31
36
6
Shell Creek
Lake DeSmet
Boxelder Creek
6
16
90
ddle String
Clear Creek
31
Rock Creek
36
31
36
31
6
1
6
1
6
Buffalo Airport
Rock Creek
High and moderate coal occurance boundary
Buffalo
Unsuitability, criteria 2, 3:
rights-of-way and easements
and buffer zones
36
31
6
Bull Creek
25
90
36
31

SOURCE: Bureau of Land Management, Proposed Coal Amendment to Wyoming Land Use Decisions, Western Powder River Basin Area, Casper District (1981).

fig. 15). BLM is considering moving the corridor several miles east to avoid the proposed lease tracts altogether (7).

Criteria #5—Outstanding scenic areas and areas of high visual sensitivity, #18—Natural resource waters, and #20—State designated unsuitability criteria, were not found to be applicable on lands considered for leasing within the five coal regions studied.

The most difficulty in application of the unsuitability criteria was associated with criteria #7—Historic and archaeological sites, #16—Floodplains, #17—Municipal watersheds, and #19—Alluvial valley floors. Problems in application of the historic and archaeological sites criterion related to the limited inventory data of these sites available at the land use and activity planning stages, and the large number of potentially important sites in certain regions. For example, most of the tract summaries for Fort Union Round I state:

> Information on cultural resource values in the area is scarce. The tract could contain significant archaeological or historical sites and/or artifacts. Loss of these cultural resources (due to mining) can be considered significant, unless more information is collected to indicate otherwise. Inventory being contracted now would raise the level of confidence that loss would or would not occur. The loss of identified values, if any exist, would be long-term and irreversible (4).

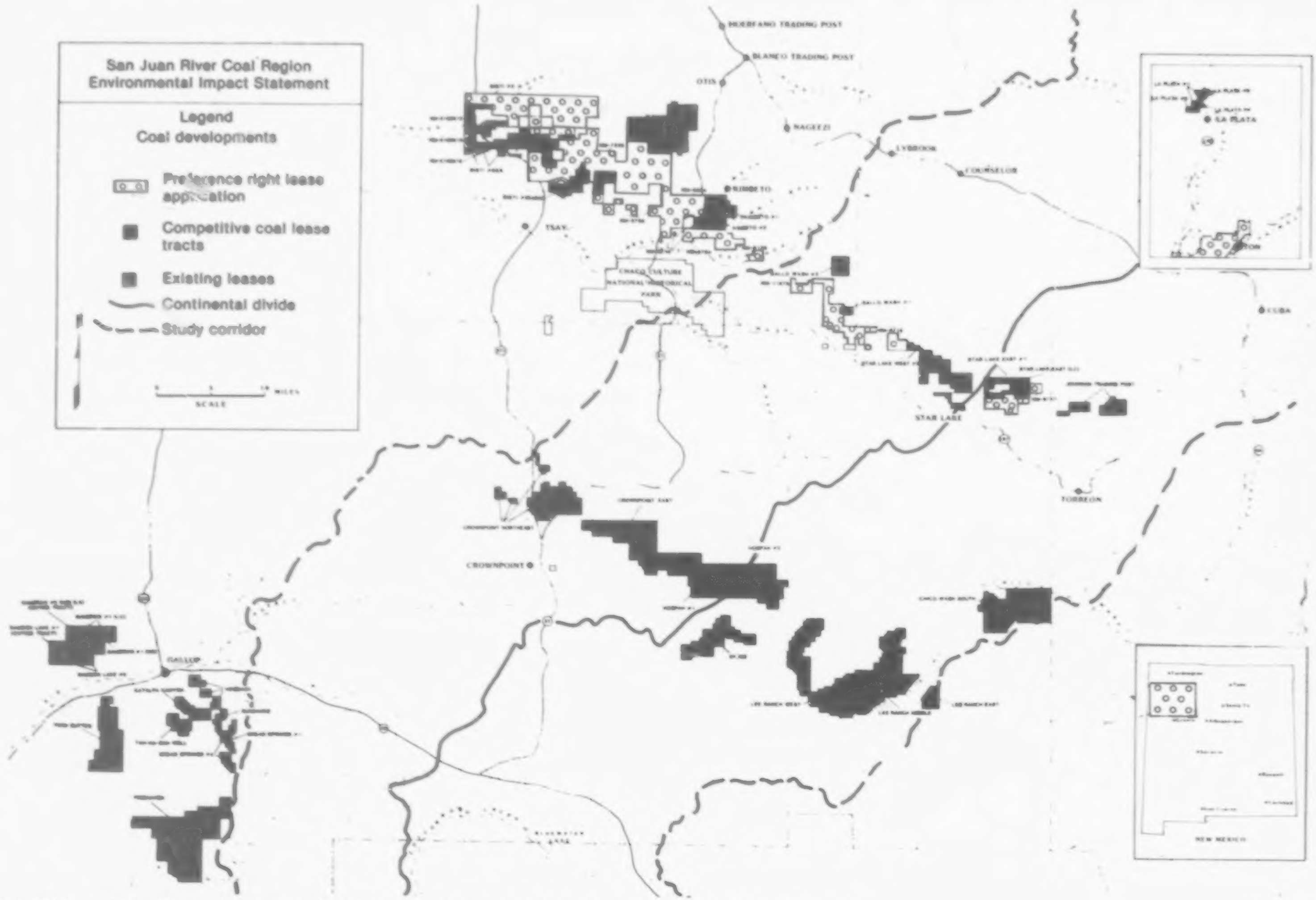
The EIS for Fort Union Round I indicates that between 55 and 95 percent of the potential lease areas had not been inventoried for cultural resources, depending on the leasing alternative (see table 10).

Application of this criterion recently has become more controversial because the regulations were changed in late 1983 to require that a site be **publicly owned and listed** on the National Register of Historic Places before criterion #7 applies. Previous regulations also included **privately owned sites *eligible* for listing** in the National Register. This 1983 rule change was a direct response to the debate over inclusion in the Dunn Center lease tract in Fort Union of portions of the Knife River Flint Quarry—a site eligible for listing (18).

Problems associated with application of criteria #16, #17, and #19 related principally to the definition of key terms in the criteria, the lack of agreement as to the extent of data necessary to apply the criteria, and how the protected resource would be affected by mining. For example, in Uinta-Southwestern Utah, Forest Service and BLM staff apparently have different interpretations of what constitutes a municipal watershed, and disagreements arose over the inclusion of watershed in a tract offered for lease (10c). The criterion for alluvial valley floors (AVFs) is the only one for which the program regulations specifically allow deferral of application to mine plan review, and final determinations regarding the identification of AVFs are almost always left to the Office of Surface Mining (OSM) and the State permitting agencies. It is extremely difficult to determine, prior to leasing, the exact boundaries of identified alluvial valley floors and whether mining would be prohibited on or adjacent to AVFs because it would interrupt, discontinue, or preclude farming, or materially damage water that supplies the AVF (see fig. 16).

With respect to the application of the unsuitability criteria related to wildlife (criteria #9 through #15), various approaches have been taken in land use and activity planning. In most cases, the variations in approach can be traced to differences in professional judgment on the ability to mitigate wildlife impacts. For example, until recently the standard approach for eagle protection involved designating a roughly one-half mile buffer zone around identified eagle nests where mining operations and seasonal access would be controlled. This leaves an island of unmined coal, which increases the difficulty of mining and reclamation. As a result, some regions have experimented with moving eagle nests in cooperation with the U.S. Fish and Wildlife Service. Although the long-term success of these experiments has yet to be determined, the results to date seem promising. However, not all BLM field personnel in all regions were aware of these experiments, and the willingness or ability of Fish and Wildlife Service offices to participate in such experiments varied among regions.

Figure 15.—Relation Between Coal Tracts in San Juan Region and National Continental Divide Scenic Trail and Study Corridor


San Juan River Coal Region
Environmental Impact Statement
Legend
Coal developments
Preference right lease application
Competitive coal lease tracts
Existing leases
Continental divide
Study corridor
SCALE
MILES
HUERFANO TRADING POST
BLANCO TRADING POST
OTIS
NAGEEZI
LYBROOK
COUNSELOR
TSAYA
CHACO CULTURE NATIONAL HISTORICAL PARK
STAR LAKE
TORREON
CUBA
CROWNPOINT
CROWNPOINT EAST
CROWNPOINT NORTHEAST
CHACO WASH SOUTH
LEE RANCH WEST
LEE RANCH MIDDLE
LEE RANCH EAST
GALLUP
LA PLATA
NEW MEXICO

SOURCE: Bureau of Land Management, *San Juan River Regional Coal Environmental Impact Statement*, Second Draft (October 1983).

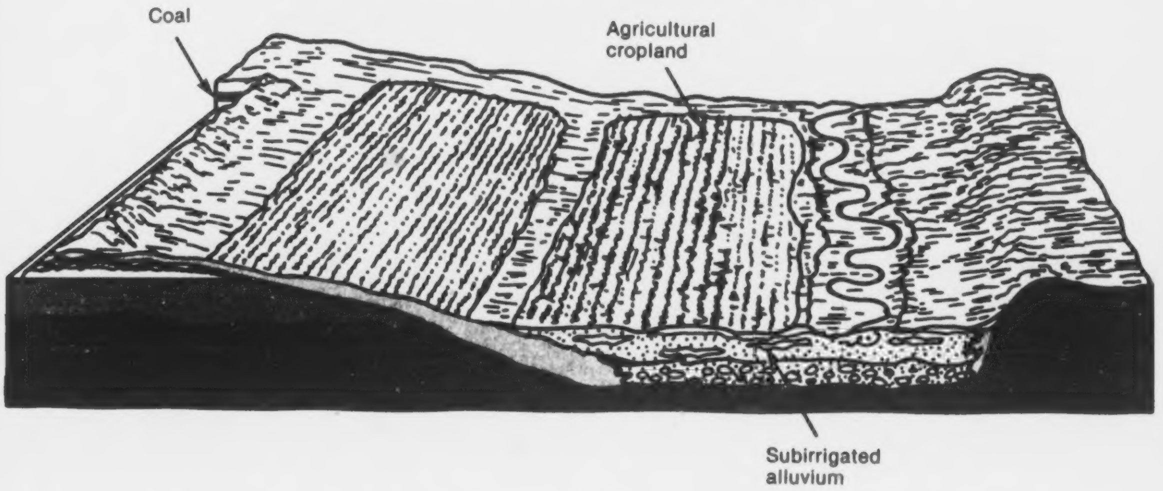
Table 10.—Fort Union Region Known Cultural Sites by Type

	Lithic scatters	Stone circle	Stone circle with other features	Other habitation	Buried site of unknown function	Stone alignments and cairns	Lithic procurement and cache	Homestead	Historic refuse	Historic mine	Historic burial	Historic limited use area	Total sites	Projected total sites	Percent to be inventoried
Alternative 1[a]	27	42	8	13	1	6	2	12	2	4	2	0	119	119-427	54
Alternative 2	102	44	9	13	1	8	14	25	10	5	2	1	234	234-766	66
Alternative 3	126	44	9	14	1	11	18	33	10	5	2	3	276	276-1,016	72
Alternative 4	116	44	9	14	1	11	16	38	13	5	2	3	272	272-1,056	72
Alternative 5	129	46	9	14	2	11	16	42	13	5	2	3	292	292-1,185	75
Alternative 6	137	46	9	14	4	11	22	54	18	5	2	4	326	326-1,463	77
Woodson PRLA ..	4	0	0	0	0	1	0	1	0	0	0	0	6	6-30	87
Woodson PRLA + Alternative 3 ...	130	44	9	14	4	12	18	34	10	5	2	3	282	282-1,046	75
Meridian exchange proposal:															
Northern Portion	4	0	0	0	0	0	1	2	0	0	0	0	6	6-295	96
Southern Portion	7	0	0	0	0	0	1	2	1	0	1	5	17	17-267	85
Total	11	0	0	0	0	0	2	4	1	0	1	5	23	23-528	90
Total + Alternative 3 ..	137	44	9	14	1	11	20	37	11	5	3	8	299	299-1,544	76

[a] Alternative 1 site types are included in the figures for Alternatives 2 through 6.

SOURCE: Bureau of Land Management, *Fort Union Regional Coal Environmental Impact Statement, Draft*, July 1982.

Figure 16.—Stylized Diagram of an Alluvial Valley Floor



SOURCE: Dollhopf, Wendy, Goering, and Hedsberg, "Hydrology of a Watershed With Subirrigated Alluvial Materials in Crop Production," Montana Agricultural Experiment Station Bulletin 715, 1979.

Application of the criteria relating to threatened and endangered species, migratory birds, and protecting habitat of species of high state interest generally was resolved by the use of mitigation measures which allowed areas with these characteristics to be carried forward in the process (see discussion of mitigation measures). However, in some regions considerable disagreement exists in defining wildlife habitat and its regional importance, particularly critical winter range. For example, in the Green River-Hams Fork region, critical winter range for mule deer, elk, and pronghorn antelope is an important issue. Three potential lease tracts exemplify the variation in treatment of this issue in the leasing process:

Atlantic Rim: Critical elk winter range occurs on part of the tract. Up to 550 elk (19 percent of the Baggs herd) winter on and near the tract. During land use planning, a decision on the suitability of this tract was deferred until more information on the herd's range was available. However, there was concern from State and local governments that if, subsequent to the study, this tract were to be found acceptable, the area could not be offered unless it had been included in land use and activity planning. Consequently, Atlantic Rim was carried through activity planning and included in the preferred alternative in the EIS for Round II (2).

Northeast Cow Creek: Critical winter range for elk exists on this tract and could be adversely affected by coal transportation to and from the proposed underground mine. As with Atlantic Rim, during land use planning BLM decided to defer determining acceptability for leasing pending the outcome of wildlife studies. Based on local interest in coal development, the tract was carried through activity planning. However, it was not included in the preferred alternative for Round II (2).

Red Rim: SMCRA allows citizens to petition for or against designation of lands as unsuitable for surface mining. The National and Wyoming Wildlife Federations petitioned to have the Red Rim tract ("deferred pending study" during Round I and considered acceptable for Round II) declared unsuitable. The petition alleges that critical winter range for pronghorn antelope would be adversely affected by mining, and that reclamation is not economically feasible. An intervention petition was filed by the surface owner, arguing that the tract was reviewed for suitability during planning for Round I lease sales. A final Petition Evaluation Document/EIS is scheduled to be completed in April 1984. BLM has found it difficult to evaluate the unsuitability petition "since no site-specific mining plan . . . has been submitted." The analysis therefore draws on previous BLM and USGS studies on the tract, as well as data on mining and reclamation at other active coal mines in the area and from the probable lessee (2).

These examples illustrate some of the difficulties in applying the unsuitability criteria related to wildlife. Accurate data on wildlife habitat and its local or regional significance often are not available during land use planning (or even activity planning), and it is unclear whether BLM has sufficient expertise to determine whether a mitigation plan submitted pursuant to a lease stipulation will be adequate. Moreover, disagreements among experts on these factors mean that decisions on wildlife-related unsuitability criteria often are political rather than biological or ecological.

Finally, it is important to note the 1982 rule changes concerning the unsuitability assessment procedures. Under these changes, which are discussed in greater detail in chapter 3, the applicability of the exceptions to the unsuitability criteria was expanded. The 1979 regulations specified that the exceptions should only be considered when one unsuitability condition exists **in an area free of other unsuitability conditions;** the 1982 rules provide for application of the exceptions and exemptions in areas **where one or more unsuitability conditions are found** (43 C.F.R. 3461.3-1). Given the already extensive use of exceptions under the 1979 regulations, and the fact that most areas reviewed for unsuitability to date were evaluated under those regulations, the revised rule may have little effect on current practice in application of the unsuitability criteria. Other changes made in the rules governing the use of the unsuitability criteria include:

- the narrowing of criterion #7 for historic and archaeological sites;
- elimination of an opportunity for public comment specifically on application of the criteria (separate from the review of the overall land use plan); and
- elimination of agricultural crop production as a use of rights-of-way on Federal lands meriting an unsuitability designation.

Analysis

In most instances, application of the unsuitability criteria has not been controversial. However, when controversies do arise, one of the most basic concerns associated with the criteria relates to BLM's ability to make definitive findings during land use planning and/or activity planning as to the unsuitability of areas for mining.

Under the present leasing program, unsuitability tends to be viewed as a "black and white issue" (i.e., a piece of land is either "acceptable" or "unsuitable"). This means that the unsuitability criteria usually eliminate only those lands with obvious "fatal flaws," giving careful consideration to the exemptions and exceptions to the criteria as provided in the regulations. Where an unsuitability decision is not clear-cut, due to limitations on available data or other constraints, potential problems are "flagged" to be evaluated in detail at the activity planning or mine plan review stage when additional data become available. As a result, there has been little justification for BLM to "bite the bullet" in application of the unsuitability criteria, and difficult decisions continually have been deferred and the exceptions and exemptions used extensively (see discussion of "Deferral of Decisionmaking").

Rather than finding areas to be unsuitable, BLM generally prefers to "exclude" areas within a tract from mining (through lease stipulations) unless the lessee demonstrates that impacts can be mitigated or lands reclaimed (6). This approach maintains flexibility, because it is possible at mine plan review to reinstate such "excluded" areas through mitigation requirements, but tract boundaries cannot be expanded to redesignate "unsuitable" areas as "acceptable" once a lease has been issued. Thus, this approach may better accommodate future changes in mining and reclamation methodologies and technologies (e.g., potential advances in habitat mitigation practices as noted in the Fort Union Coal Region Case Study; see vol. II). However, it also can be viewed as further evidence of deferral of decisionmaking. The relative merits of earlier versus later decisions on environmental compatibility are discussed further in the section on "Deferral of Decisionmaking," below.

Continued concern about the application of the unsuitability criteria and the extent of utilization of the exceptions and exemptions for any particular tract can be reflected in the summary ranking for that tract by the Regional Coal Team. For example, concerns about eagle protection, floodplains, and alluvial valley floors contributed to the RCT's decision to lower the ranking of the Lay Creek Tract in the Green River-Hams Fork Coal region (see table 11). This tract has not been included in the preferred alternative in either round of leasing in this region, but could be offered in Round II under a maximum leasing scenario.

Data were insufficient in many cases to apply the criteria properly. The EISs for all of the regions acknowledge data deficiencies, particularly about historic and archaeological sites, critical winter range for wildlife, municipal watersheds, and alluvial valley floors. The cutbacks in the resource inventory program within BLM for the collection of additional basic resource data may have contributed to this problem (see discussion of "Data and Analysis"). Data collection and availability in split estate areas also create problems in the application of the unsuitability criteria (see discussion of "Leasing on Split Estates"). The amount of coal-bearing lands that must be reviewed in the land use planning process also can have a significant effect on the quality and quantity of data available to support application of the unsuitability criteria (i.e., the larger the area, the less likely that sufficient high quality data will be available to make final unsuitability determinations).

Numerous instances of "acceptable pending further study" determinations relative to application of the unsuitability criteria were found in the five leasing regions. (No finding of "unacceptable pending further study" is utilized by BLM.) The more complex the criterion, the greater the likelihood that its application will be deferred (e.g., the widespread practice of taking advantage of the option to defer application of the alluvial valley floor criterion, deferral in application of criterion #15—protection of habitat of species of high state interest). BLM points out that no lease tracts have been offered where an "acceptable pending study" determination still pertains, although numerous tracts have included lease stipulations requiring data collection to resolve

Table 11.—RCT Rankings for Lay Tract, Rounds I and II

Ranking factors	Round I	Round II
Coal economics	State: medium BLM: high	—[a]
Environmental	State: low BLM: medium	—[a]
Social economic	State: low BLM: high	—[a]
Summary ranking	State: low BLM: high	moderate
Comments	State ranked as least desirable of Colorado tracts because of transportation system concerns. Possibility of population impacts to Maybell. BLM believes railroad will be extended from the east. One of the most competitive tracts due to its isolation from existing operations. AVF divides tract	Lack of transportation—diverse surface ownership—conservation of resource—potential wildlife and reclamation problems—alluvial valley floor and lambing areas

[a] Not broken down by subfactors in Round II Draft EIS.

SOURCE: Bureau of Land Management, *Green River-Hams Fork Final Environmental Impact Statement, Coal*, vol. I, August 1980; and *Draft Environmental Impact Statement, Coal, Green River-Hams Fork Region, Round Two*, 1983.

uncertainties about impact mitigation or tract reclaimability (see discussions of "Mitigation Requirements" and "Deferral of Decisionmaking").

It should be emphasized that considerable disagreement exists as to the extent of information needed to make informed decisions about the unsuitability criteria. For example, what level of survey is needed prior to a lease offering to make supportable determinations about historic and archaeological sites? These decisions are scheduled to be made during the first stage of the leasing process, when the fewest data are available and the largest land area must be evaluated. If the leasing program continues to experience problems related to inadequate data to make final unsuitability determinations during land use planning, perhaps the program could be restructured to explicitly allow those determinations to be deferred to activity planning, so long as the data would be available prior to final tract ranking and selection of the tracts to be included in the preferred alternative.

BLM has undertaken some special data-collection efforts to address problems encountered in application of the unsuitability criteria during land use planning (e.g., wildlife studies in several regions after preparation of the MFP Update/Amendment revealed data gaps). However, time, staff, and budget constraints largely precluded substantial collection of new data for purposes of applying the unsuitability criteria (e.g., there was little opportunity for field studies in some regions). In addition, in some cases, participation by other agencies in application of the unsuitability criteria was limited. Finally, it was noted that in numerous cases BLM did not use relevant existing information (e.g., information contained in permit applications for nearby existing or proposed coal mines; see discussion of "Data and Analysis").

Possibilities for Expansion of the Unsuitability Criteria

A number of recommendations have been made for additional unsuitability criteria, including criteria for wetlands, Tribal sacred sites, single grave sites (as opposed to cemeteries), paleontological sites, producing oil and gas wells, other reserved Federal lands (e.g., military reservations), air quality, and reclaimability. Some parties also believe that an additional criterion relating to "insufficient data" is merited.

Wetlands typically are protected under one or more of the existing unsuitability criteria (e.g., floodplains or alluvial valley floors). Oil and gas wells and other reserved Federal lands generally come under the multiple-use screen, although that screen has not been applied consistently in such circumstances (e.g., many of the tracts considered acceptable for leasing in Fort Union overlap a producing oil field and important defense installations). As a result, it has been suggested that a new criteria be established for producing oil/gas areas, and that the exclusion for reserved Federal lands, such as military reservations, be reinstated.

In the San Juan region, considerable debate has centered on how to deal with sacred sites. Currently, lands containing such sites continue in the leasing process but with stipulations aimed at requiring consultation and allowing ceremonies of local Native Americans when such sites will be disturbed by mining. With regard to single grave sites, the general approach has been either to establish buffer zones (similar to protection of cemeteries) if the grave sites are to remain in place or to mitigate the impacts (including consent required under State law) if they are to be moved.

Paleontological resource issues have been much debated (particularly in San Juan) with little agreement as to the value of in-situ preservation. Responses to the problem have varied from temporarily excluding areas from leasing (e.g., the Fossil Forest in New Mexico) to developing plans to deal with paleontological sites encountered during mining (10a; 8b).

With respect to an unsuitability criterion relating to air quality, problems resulting from mining (principally fugitive dust) generally are controllable through specific mitigation measures to be applied at the mine plan stage. Compliance with air quality laws and regulations is incorporated by reference to the Clean Air Act in coal leases and in surface mine permits.

Considerable debate exists as to the need for an additional unsuitability criterion for reclaimability. Currently, reclamation potential is assessed by BLM during activity planning and the results of that assessment considered by the RCT in tract ranking. (However, there appears to be little relationship between such assessments of reclamation potential and overall tract rankings; see table 12.) Some participants in leasing firmly believe that the intent of section 522 of SMCRA is that areas should be excluded from leasing if reclamation pursuant to SMCRA is not technologically and economically feasible. Further, they contend that it is only prudent to gather the necessary data and make the reclaimability decision during the leasing process because permitting agencies are more likely to impose mitigation requirements than to exclude areas from mining. Therefore, from both statutory and policy standpoints, some parties recommend that an unsuitability criterion relating to reclaimability should be applied in the leasing program. The National Resources Defense Council (NRDC) currently is suing BLM over the lack of an unsuitability criterion for reclaimability (15).

Other participants in leasing contend that reclaimability is assessed implicitly through application of all 20 of the unsuitability criteria, or that reclaimability can only be assessed appropriately at the mine plan review stage when sufficient detailed information regarding soils, vegetation, and the hydrologic system will be available. In addition, at that stage, SMCRA places an explicit affirmative burden on the permit applicant to demonstrate that reclamation is technically and economically feasible. A positive finding on reclaimability prior to leasing could jeopardize the ability of a permitting agency to deny all or part of a mine plan due to a failure to demonstrate successful reclamation.

MITIGATION REQUIREMENTS

The Programmatic EIS issued by DOI in 1979 for the Federal coal management program defines "mitigation" as ". . . a policy, procedure, or action intended to avoid, minimize, or help compensate for damage that could be caused by decisions made by the Department of the Interior about the management of Federal coal" (3). Mitigation is intended to protect individuals and communities from potential (or projected) social and economic impacts, and to protect the physical environment (3). Mitigation techniques can be specific or generic, and can address either site-specific or cumulative impacts. They can be designed to accommodate uncertainties about potential impacts or tailored to cover well-understood mining and reclamation situations. Requirements for impact mitigation included in a lease or mining permit might reiterate requirements of current laws and regulations, or they may impose higher standards. They usually apply to lease tracts, but may cover offsite locations affected in some manner by the mining and reclamation operations.

This section discusses the role of lease stipulations as a means of ensuring that Federal coal is developed (and reclaimed) in an environmentally compatible manner. The section outlines the rationale for imposing stipulations and conditions, discusses their uses and when they might be imposed, and documents the controversy that surrounds their use. Mitigation requirements for social or economic impacts of coal leasing or mining are not addressed in this report.* Other means of achieving mitigation, such as excluding areas from mining based on multiple-use tradeoffs or the unsuitability criteria, are discussed separately.

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*It should be noted that a 1983 BLM memorandum specifies that "the choice of mechanisms by which off-site impacts (i.e., socioeconomic) can be handled by the local communities" should be a State responsibility. Therefore, the memo directs that "the Bureau of Land Management should not be developing social or economic mitigation stipulations for Federal coal leases" (11a).

Table 12.—Potential Reclamation Problems, Green River-Hams Fork Region, Round II

Leasing alternative[a]	Low precipitation	Wind erosion	High evaporation rates	Lack topsoil materials	Unfavorable soil chemistry	Steep slopes 40%	RCT tract ranking	Potential reclamation problems noted in comments on tract ranking
Low alternative:								
Deadman	X	—	X	X	X	—	High	—
Leucite Hills	X	—	X	X	X	—	High	—
Point of Rocks	X	—	X	X	X	—	High	—
Tract 98	X	—	X	X	X	—	High	—
Prairie Dog	—	—	—	X	X	—	High	—
Little Middle Creek	—	—	—	—	—	—	High	—
Moderate alternative:								
Atlantic Rim	X	—	X	X	X	X	High-moderate	—
Byrne Creek	X	—	X	X	X	—	Moderate	—
Corral Canyon	X	—	X	X	X	—	High	—
Wild Horse Draw	X	—	X	X	X	—	Moderate	—
Rattlesnake Mesa	—	—	—	—	—	—	High	—
Signal Butte	—	X	—	—	—	—	High	X
High alternative:[b]								
Pio	X	—	X	X	X	—	Moderate	—
Winton	X	—	X	X	X	—	Moderate	—
Indian Springs	X	—	X	X	X	—	Moderate	—
Peck Gulch	—	—	—	—	—	—	Moderate	—
Iles Mountain	—	—	—	X	—	—	Moderate	X
Fish Creek	—	—	—	—	—	—	Moderate	—
Maximum alternative:								
Northeast Cow Creek	X	—	X	X	X	—	Low	—
Bell Rock	—	—	—	—	—	—	Moderate	—
Williams Fork Mountain	—	—	—	—	—	—	Moderate	X
Lay Creek	—	X	—	—	X	—	Moderate	X
Horse Gulch	—	X	—	—	X	—	Low	—

[a] Alternatives are additive; i.e., moderate alternative also includes tracts listed in low alternatives, high alternative includes low and moderate alternative tracts, and maximum alternative incorporates all tracts listed.

[b] The preferred alternative.

SOURCE: Bureau of Land Management, *Draft Environmental Impact Statement, Coal, Green River-Hams Fork Region, Round Two*, 1983.

The Role of Mitigation Requirements

The development of mitigation requirements is an essential element of compliance with the National Environmental Policy Act (NEPA) and with the specific goals and standards of FCLAA, FLPMA, and SMCRA. Based on these statutory mandates, the Federal coal management program was designed to employ increasingly specific environmental mitigation measures from land use planning through mine development and reclamation.

Portions of coal resource areas may be dropped from further consideration for leasing throughout the process (mitigation through "avoidance"). For example, application of the unsuitability and multiple-use screens during land use planning mitigates impacts by screening out areas where other resource values are deemed more important than coal development (see table 9). Alternatively, decisions on particular areas might be deferred until the impacts can be mitigated more effectively (after new mining or reclamation techniques are developed), or are considered necessary (e.g., in an energy crisis).

The EIS provides a further opportunity for mitigation of adverse impacts during pre-lease planning. The CEQ regulations implementing NEPA require inclusion of "appropriate mitigation measures" where "mitigation" is defined as: avoidance; minimization; rectification (repair, rehabilitate, restore); reduction over time; or compensation (40 C.F.R. 1502.14(f)). A lease typically includes stipulations from these and other sources intended to ensure mitigation, or at least to alert the permitting agency and potential bidders that mitigation will be necessary.

Toward the end of the leasing process, when more comprehensive data and analyses are available, conditions may be imposed on a mining permit to require mitigation of a specific environmental impact, to avoid an impact completely, or to specify use of a technology or methodology to achieve mitigation. The final check on mitigation is onsite inspection and enforcement of the laws and regulations (and policies) designed to control the adverse environmental impacts of coal development. Monitoring and inspection of ongoing mining operations generates additional information which can help improve the understanding of environmental effects and the efficacy of mitigation measures.

All of the mitigation opportunities listed above have been employed in the coal regions studied in this report. However, the limitations on the adequacy of pre-lease data and analyses (discussed separately), as well as departmental policy to make as much coal available for lease as is environmentally acceptable, have meant that the frequency of the use of pre-lease mitigation measures and the stringency of the requirements imposed have varied from region to region.

Origins of Mitigation Requirements

All parties to the Federal coal management program have opportunities to propose lease stipulations or permit conditions they consider necessary to reduce or compensate for adverse impacts, although BLM and the permitting agencies have the final responsibility for imposing stipulations or conditions. In general, the public participates more actively in pre-lease planning than mine plan review, and thus is more involved in developing lease stipulations than permit conditions. However, substantial variation exists among regions in terms of the degree to which parties other than BLM and potential lessees were involved in formulating lease stipulations, and the types of concerns introduced by those parties.

For example, well-organized public input resulted in development of a series of subsidence and water resource protection stipulations for a lease tract in the Colorado portion of the Uinta region. In the same region, U.S. Forest Service concern led to use of a relatively detailed lease stipulation regarding monitoring of subsidence (see Box A). National Park Service and public concern resulted in specific mitigation requirements for the protection of cultural resources in the San Juan coal region. Similarly, Federal and State wildlife authorities precipitated special lease stipulations for protection of game and nongame species in Green River-Hams Fork, Fort Union, and San Juan, and the U.S. Fish and Wildlife Service has been instrumental in the development of

Box A

"The following stipulations will be included in addition to the standard stipulations on all leases issued on Forest Service land. . . .

"6. The lessee shall establish a monitoring system to locate, measure, and quantify the progressive and final effects of underground mining activities on the topographic surface, underground and surface hydrology, and vegetation. The monitoring system shall utilize techniques which will provide a continuing record of change over time and an analytical method for location and measurement of a sufficient number of points over the lease area. The monitoring shall be an extension of the baseline data and shall be conducted by a method approved by the OSM in consultation with and concurrence by the [Forest Supervisor] and [BLM State Director].

"7. Underground mining operations shall be conducted in such a manner so as to prevent surface subsidence that would (1) cause the creation of hazardous conditions such as potential escarpment failure and landslides, (2) cause damage to surface structures, and improvements, and (3) damage or alter the flow of perennial streams. The lessee in his mining plan shall provide specific measures for the protection of escarpments. The OSM in consultation with and concurrence of the [BLM State Director] and [Forest Supervisor], shall approve such measures and may prescribe any additional measures to be employed such as mining methods, specify the amount of coal recovered, and determine any corrective measures considered necessary to assure that escarpment failure does not occur except at specifically approved locations, or that hazardous conditions are not created." (emphasis in original)

SOURCE: Uinta Round II Final EIS.

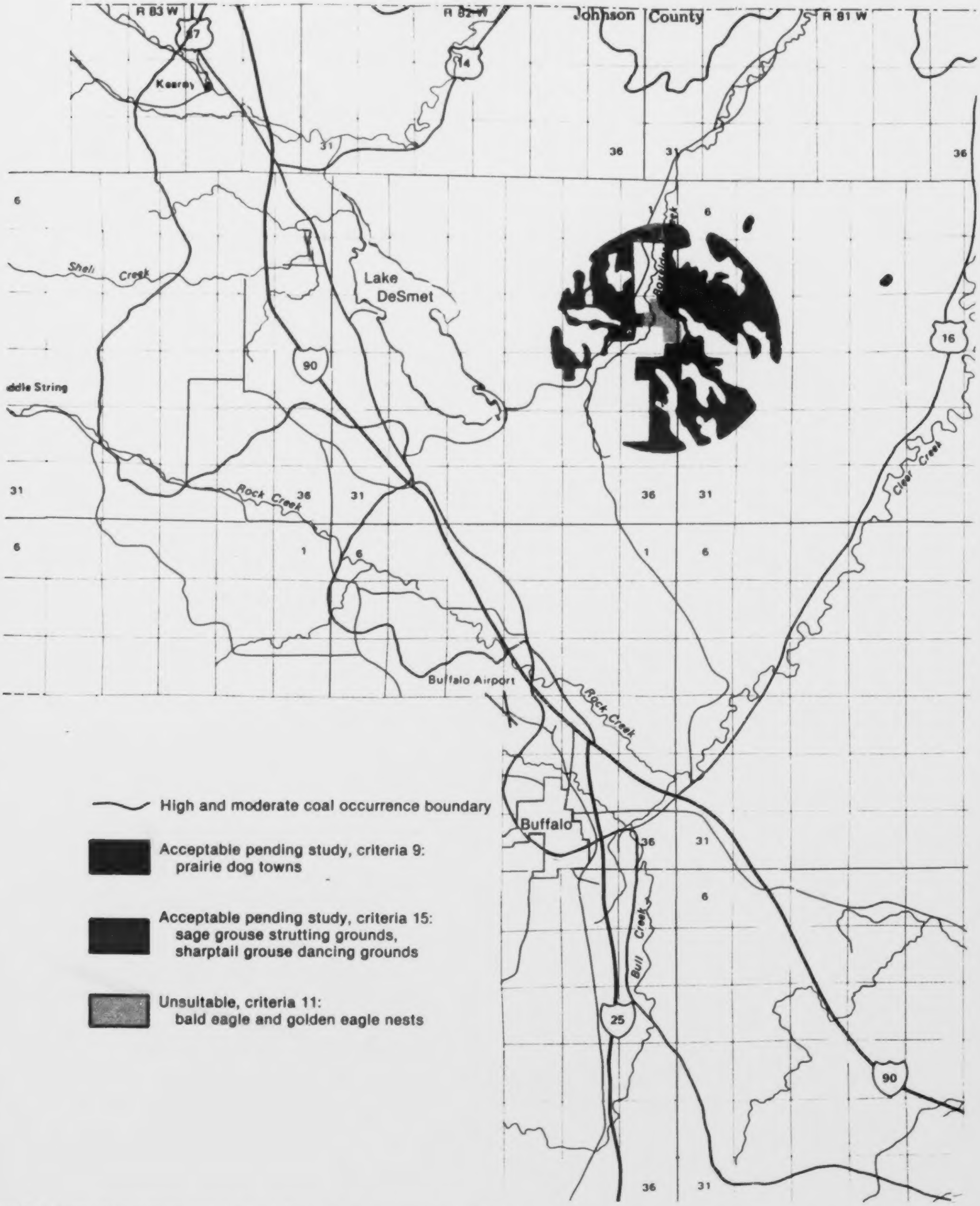
many of the more substantive mitigation measures to protect threatened and endangered wildlife species.

Proposed lease stipulations typically are summarized for review three times during the preleasing process: when the Management Framework Plan is updated or amended (or an RMP is prepared) to support leasing decisions, during Site Specific Analysis, and in the EIS. However, their evolution usually is not well-documented and may be difficult to trace. Final versions of stipulations are published at the time of lease offerings and when the lease is issued. Because detailed descriptions of specific mining operations are not available when a tract is leased, stipulations are reviewed and revised, if necessary, at each step of the leasing process and again at the mine plan stage. Any modifications made to stipulations after a lease is issued must be agreed to by both BLM and the lessee. Permit conditions may be imposed during review of the mining and reclamation plan, or inspection and enforcement of a mining operation. In general, the level of technical and site specificity in mitigation requirements increases over time as more data become available. Lease stipulations imposed early in the process are more likely to exclude areas from further mining, while permit conditions tend to accommodate mining activity as long as it is conducted in an environmentally compatible manner.

Land Use Planning

Decision documents for updating or amending the Management Framework Plan (MFP) or preparing a Resource Management Plan (RMP) usually contain mitigation measures that have evolved from staff field work, earlier planning activities, consultation with other regulatory agencies, application of the unsuitability and multiple-use screens, and public participation. For example, in applying the unsuitability criteria, additional inventories needed to make unsuitability determinations might be described, or mitigation techniques that will protect the affected resources may be identified, or areas that are closed to certain activities may be delineated (see fig. 17). Thus, the San Juan-Chaco MFP Update limits disturbance of paleontological resources in the Fossil Forest area for 10 years and protects known important Chacoan and other archaeological sites and Navajo sacred sites through lease stipulations

Figure 17.—Potential Buffer Zones Resulting from Application of the Wildlife Unsuitability Criteria, Western Powder River Basin


R 83 W
R 82 W
Johnson County
R 81 W
87
14
Kearney
31
36
31
36
6
6
Shell Creek
Lake DeSmet
90
16
ddle String
Clear Creek
31
Rock Creek
36
31
36
31
6
1
6
1
6
Buffalo Airport
Rock Creek
Buffalo
36
31
6
Bull Creek
25
90
36
31
High and moderate coal occurrence boundary
Acceptable pending study, criteria 9: prairie dog towns
Acceptable pending study, criteria 15: sage grouse strutting grounds, sharptail grouse dancing grounds
Unsuitable, criteria 11: bald eagle and golden eagle nests

SOURCE: Bureau of Land Management, Casper District, *Coal Amendment to Wyoming Land Use Decisions, Western Powder River Basin Area* (1981).

that prohibit surface disturbance or subsidence in particular areas. Other stipulations proposed in that MFP Update specify that impacts to wildlife habitat will be mitigated, require compliance with any State-approved water replacement plan, and mandate post-mining transfer of a lessee's water wells to BLM.

Lease stipulations developed during land use planning are carried forward to, and reassessed during, activity planning. However, the documents supporting a decision to impose stipulations during land use planning typically include little documentation. As a result, it may be difficult for interested parties to determine whether sufficient data were collected to justify any suggested stipulations or other recommendations such as declaring areas acceptable or unsuitable for further consideration for leasing.

Activity Planning

During activity planning, the analysis performed to update an MFP to support leasing decisions is refined and site specific analyses are completed on tracts carried forward from land use planning as acceptable for further consideration for leasing. With the development of more comprehensive environmental resource data during activity planning comes the potential to identify mitigation requirements that are more tract-specific, as well as to find major obstacles to mining that were not identified earlier. However, because of the tract-specific nature of the analysis that supports activity planning, little consideration can be given to the cumulative impacts of the development of several tracts within one area or to the mitigation of such cumulative impacts at this stage unless a requirement for mitigation of cumulative impacts has carried through from the MFP Update.

The detailed inventorying and analysis required for activity planning can be a time-consuming process, and schedule and staff limitations can mean that lease stipulations developed during land use planning may not be reevaluated at this stage. In some instances, "boiler plate" stipulations are developed in SSAs. For example, in the San Juan region, the SSAs included 12 generic mitigation requirements (later dropped) applicable to the surface and/or underground tracts considered acceptable for leasing.

During preparation of the regional EIS—the second major environmental analysis in activity planning—the more significant anticipated impacts of mining on lease tracts are evaluated in detail, including potential cumulative impacts, and alternative or additional mitigation requirements that could reduce or eliminate adverse effects are presented for consideration by the Secretary in the final leasing decision. Because EISs are based on a "worst-case" analysis of the potential impacts of mining, they tend to report a wide range of **possible** mitigation measures, including the lease stipulations identified in the MFP Update and SSAs. For example, the second draft EIS for the San Juan River region includes eight pages of "alternative mitigating measures" for air quality, paleontology, water resources, wildlife, cultural resources, wilderness, recreation, land uses, transportation, social economic factors, and American Indian concerns. That section is prefaced by the following statement:

> The analysis of the environmental effects of the proposed action and major program alternatives . . . describes the environmental effects remaining after application of and compliance with all regulations, statutes, standard lease terms and agency committed measures such as special stipulations to carry out the results of the application of unsuitability criteria. This section on mitigating measures describes additional actions that might be taken to further reduce the adverse effects of the proposal. In accordance with CEQ regulations, these additional measures are not included in the proposed action or analyzed in [the EIS]. Some of the measures listed are alternatives to existing requirements; others cover new areas. These measures could be required by BLM, BIA, OSM or the State of New Mexico. A decision whether to adopt any of these measures will be made as part of the process to decide whether and how much coal will be leased (7).

As noted previously, proposed lease stipulations can be refined or eliminated at any stage of the leasing process, and some of those developed during land use planning and SSA may not be carried forward in the regional EIS if the analysis in that document indicates that less restrictive mitigation measures are adequate. This is the case with the boiler-plate stipulations for the San Juan region (mentioned above), which were dropped in the EIS (10a). Similarly, pre-EIS stipulations requiring data collection on particular tracts in Powder River were reevaluated and made discretionary in the EIS (that the data collection "may" be required at the mine plan stage (10b)), and a stipulation in Uinta that originally restricted all surface activities in a particular area was relaxed to allow a mine portal (10c). Such changes provide greater flexibility for the permitting agency and the operator, but leave BLM open to charges that it "backed-off" on mitigation requirements, and undermine the program's predictability and stability.

On the other hand, lease stipulations may not only be carried forward to the EIS on a regional lease sale, but made more stringent at that stage. For example, in Uinta an early stipulation requiring study and coordination of construction activities that might affect water supply was strengthened to require protection of the water supply (10c).

Secretarial Issue Document

The final pre-lease review of proposed stipulations occurs with the Secretarial leasing decision as documented in the SID. Again, mitigation requirements can be imposed, relaxed, strengthened, or eliminated during this review. For example, in Fort Union, recommended mitigation techniques for the Knife River Flint Quarry (eligible for listing in the National Register) were carried forward from the MFP, but were appealed by the operator interested in the tract. The SID notes that the issue "is currently being addressed by a proposed rule change" (now final) that requires **actual** listing in the National Register in order for an area to be considered unsuitable under criterion #7 (18). This decision on the flint quarries aroused such controversy that the two most sensitive sections of land were deleted from the tract for political reasons prior to the lease offering (11). However, mitigation measures essential to the identification of potential impacts in the EIS are not supposed to be relaxed or dropped in the SID, unless the impacts of doing so are analyzed in that document, or unless the Secretary finds the mitigation measure to be unnecessary (6).

Mine Plan Review

There are three major issues related to mitigation measures at the mine plan review stage. First is the use of permit conditions, which typically are developed by the reclamation agency reviewing the permit application and are then reviewed and negotiated by the applicant. When the regulatory agency decides that a permit may be issued with certain conditions, the proposed approval, along with the conditions, is made available for public review. The policy of most State permitting agencies is to keep permit conditions to a minimum; i.e., to avoid imposing conditions on permits as a substitute for information that the permitting agency needs to make findings of compliance with SMCRA and applicable State statutes and regulations. Thus, in the view of permitting agencies, the more specificity needed in permit conditions, the less adequate the plan being reviewed is likely to be.

Second, lease stipulations are reviewed at this stage, and may be revised or dropped if BLM and the lessee agree. Because most of the tracts leased since 1979 do not yet have approved mine plans, it is not possible to determine whether lease stipulations developed for those tracts will remain unchanged throughout the permit and mining process.

Third, does BLM have, or should the Bureau be expected to have, the expertise to evaluate responses or revisions to lease stipulations, or should the permitting agency be responsible for that evaluation.

Reasons for and Types of Mitigation Requirements

Mitigation requirements can provide means of resolving data inadequacies, alerting regulators and bidders to problem areas, resolving conflicts among parties, providing for the reclamation or replacement of resources, avoiding impacts altogether, deferring decisions, specifying site specific mining or reclamation techniques, and compensating parties adversely affected by mining.

Resolving Data Inadequacies

One of the more common uses of lease stipulations and/or permit conditions is as a mechanism for resolving data inadequacies. In the case of **lease stipulations,** these might merely defer a decision on environmental compatibility and alert the permitting agency to the need for additional data, or they might require the lessee to collect specific data. For example, in the Uinta region, a lease stipulation for a proposed underground mine requires detailed geotechnical studies prior to construction of a portal and associated surface facilities, because the area is prone to landslides (10c). Other examples include lease stipulations requiring inventories of water quality and/or quantity in Uinta-Southwestern Utah and Powder River; of cultural resources and paleontology in San Juan and Uinta; and of wildlife habitat in Fort Union (see Box B). Some public interest groups have expressed concern that, to the extent that lease stipulations are being used to fill data gaps, they fail to provide adequate protection for resources yet to be identified.

Permit conditions also can be used to require the collection of additional data in order to make final decisions about mining or reclamation methods in particularly sensitive areas. In most cases, permit conditions for data collection specify monitoring of certain aspects of mine development in order to better understand particular types of impacts.

Mitigation requirements specifying data collection raise several issues. Because of the expectation that BLM will have collected sufficient data for informed decisionmaking pre-lease, some data-related lease stipulations are perceived as indicating that BLM was not able to fulfill its land use and activity planning mandate (see separate discussion of "Deferral of Decisionmaking"). A parallel concern arises when the regulatory agency issues a permit with conditions that require additional data. However, permit conditions typically do not defer decisions (do not approve mining in specified areas pending evaluation of the data), unless the additional data needs are keyed to determining appropriate mitigation or reclamation techniques.

Alternatively, if pre-lease data are viewed as adequate, then lease stipulations requiring the lessee to collect additional data may be viewed as duplicating or usurping the authority of the permitting agency. For example, proposed stipulations requiring an inventory of water rights and use on a tract in Uinta (the Paonia D Seam tract; see below), have been criticized as an unnecessary restatement of State procedures applied to all such mining situations, while environmental groups and local residents feel the added requirements are necessary (10c).

In other instances, lease stipulations may be more stringent than, or in conflict with, the permitting agencies' normal procedures. For instance, in the San Juan region, a standard BLM proposed lease stipulation requires interruption of fossil-disturbing activities if fossils of possible significant scientific interest are uncovered. The State of New Mexico originally had a separate voluntary procedure for mitigating paleontological impacts. Although no conflict might have existed, the differences between the two measures had not been assessed completely when the State put forward a revised mitigation program, which currently is under review by BLM (6).

A second major concern about lease stipulations requiring data collection is the ability to evaluate the results. For instance, in the case of the paleontological stipulation in San Juan (mentioned above), extensive disagreement still exists among experts on the appropriate mitigation measures for important fossil resources in the area. Thus it is unclear who will evaluate the information from lease tracts if fossils of possible scientific interest are found during mining, and what criteria will be used to determine whether the data submitted are adequate to satisfy the stipulation. Other lease stipulations that pose this issue include requirements for ethnographic studies in San Juan, for hydrologic data in Powder River, for extensive ecological resource monitoring in Uinta, and for certain wildlife studies in Green River-Hams Fork.

Options for resolving concerns about lease stipulations that require data collection include using discretionary language in the stipulation, such

Box B.—Examples of Lease Stipulations Intended to Resolve Data Inadequacies

All Regions:

"(a) Cultural Resources (1) Before undertaking any activities that may disturb the surface of the leased lands, the lessee shall conduct a cultural resource intensive field inventory in a manner specified by the authorized officer of the BLM or of the surface managing agency (if different) on portions of the mine plan area and adjacent areas, or exploration plan area, that may be adversely affected by lease-related activities and which were not previously inventoried at such a level of intensity. The inventory shall be conducted by a qualified professional cultural resource specialist (i.e., archaeologist, historian or historical architect, as appropriate), approved by the authorized officer of the surface managing agency (BLM if the surface is privately owned), and a report of the inventory and recommendations for protecting any cultural resources identified shall be submitted to the Regional Director of the Office of Surface Mining (or the Authorized Officer of BLM if activities are associated with coal exploration outside an approved mining permit area), or the surface managing agency (if different). The lessee shall undertake measures, in accordance with instructions from the Regional Director (or the Authorized Officer of BLM if activities are associated with coal exploration outside an approved mining permit area), to protect cultural resources on the leased land. The lessee shall not commence the surface disturbing activities until permission to proceed is given by the Regional Director (or the Authorized Officer of BLM if activities are associated with coal exploration outside an approved mining permit area). . . .

"(3) The cost of conducting the inventory, preparing reports, and carrying out mitigation measures shall be borne by the lessee. . . .

"(b) Paleontological Resources (1) Before undertaking any activities that may disturb the surface of the leased lands, the lessee shall contact the Bureau of Land Management to determine whether the authorized officer will require the lessee to conduct a paleontological appraisal of the mine plan and adjacent areas, or exploration plan areas, that may be adversely affected by lease-related activities. If the authorized officer determines that one is necessary, the paleontological appraisal shall be conducted by a qualified paleontologist approved by the authorized officer or the surface managing agency (BLM if the surface is privately owned), using the published literature and, where appropriate, field appraisals for determining the possible existence of larger and more conspicuous fossils of scientific significance. A report of the appraisal and recommendations for protecting any larger and more conspicuous fossils of significant scientific interest on the leased lands so identified shall be submitted to the authorized officer of the surface managing agency (BLM if the surface is privately owned). When necessary to protect and collect the larger and more conspicuous fossils of significant scientific interest on the leased lands, the lessee shall undertake the measures provided in the approval of the mining and reclamation plan or exploration plan. . . ."

SOURCE: Bureau of Land Management, U.S. Department of the Interior, Standard Lease Form.

Uinta-Southwestern Utah, All Tracts on National Forest Lands:

"Prior to mining, the lessee shall perform a study to secure adequate baseline data to quantify the existing surface resources on and adjacent to the lease area. The study will be established in consultation with and approved by the [Regional Forester], the **OSM,** and [BLM] and shall be adequate to locate, quantify, and demonstrate the interrelationship of the geology, topography, surface hydrology, vegetation, **soil** and wildlife. Baseline data will be established so that future programs of observation can be incorporated at regular intervals for comparison." (emphasis in original)

SOURCE: Round II Final EIS.

Green River-Hams Fork, All Wyoming Tracts:

"The lessee will be required to monitor and inventory the lease area for establishment of potential black-footed ferret habitat (i.e., prairie dog towns) and, if any such habitat is found, to conduct ferret inventories, all in accordance with the guidelines below. In the event that ferret occurrence is identified, the lessee will be required to adhere to any suggested modifications in the mining operation provided by the Fish and Wildlife Service and the BLM.

"The following Black-Footed Ferret Inventory Guidelines will be followed. Proposed developments such as coal lease lands, power plant sites, well fields, dam sites, and other major, block-type developments should be surveyed for prairie dogs before the project is approved. If prairie dogs are found on the proposed site, colonies should be mapped on topographic maps, and each colony surveyed using recommended Black-Footed Ferret Survey Procedures. Ferret searches should be scheduled as close to actual construction as is reasonable to minimize the possibility of missing ferrets that might move onto the area during the period between completion of surveys and the start of construction. Where project disturbance takes place over a long period of time, such as on a coal site, additional surveys for black-footed ferrets are recommended."

SOURCE: Round II Draft EIS.

that it merely alerts the lessee and the permitting agency to the possible need for additional data, and thus provides flexibility at the mine plan review (the Powder River hydrologic data stipulations mentioned previously); or providing that the stipulations are not intended to conflict with or preempt regulatory authority and can be renegotiated during mine plan review.

Raising Red Flags

A second common use of lease stipulations is to raise "red flags" indicating that special attention should be paid to particular segments of the mining and reclamation plan (see Box C). This use of stipulations usually reflects a desire to alert permitting agencies or bidders to potential environmental problems associated with a tract. As noted above, such stipulations also are useful for indicating potential data-collection needs to remedy anticipated deficiencies in baseline data required for the mining and reclamation permit.

For example, the lease stipulation mentioned previously that requires detailed geotechnical studies in the Uinta region might duplicate State practices, but it also serves as advance notice to the lessee that more detailed information will be required in the mine plan than might be expected under normal circumstances. Therefore, the stipulation might help avoid delays in processing of the permit application. Other lease stipulations clearly are intended to suggest mitigation techniques that otherwise might be overlooked at the permit review stage (e.g., the proposed stipulations governing the treatment of sacred sites in the San Juan region).

Resolving Conflicts

When all parties to a particular leasing or permitting decision get together to develop mitigation requirements, those requirements represent a form of conflict resolution. The most notable instance of this is the detailed set of special lease stipulations for the protection of water and water rights at the Paonia D Seam Tract in the Uinta region, which were negotiated by local residents, environmental groups, the probable lessee* the State, and BLM (see Box D). An example of a more general conflict resolution situation is the paleontological stipulation in San Juan, which resulted from disagreement among scientific experts and among agency decisionmakers over the proper mitigation measures for regional fossil resources.

Tract-specific negotiated lease stipulations raise concerns if all parties to the leasing decision are not involved in the negotiations. For instance, if

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*The Paonia D Tract was not considered a maintenance tract under the program regulations, even though the company with the most interest in the tract bid on it as a means of continuing operations at an adjacent mine and was the sole bidder.

Box C.—Examples of Lease Stipulations Calling Attention to Potential Problems on Lease Tracts ("Red Flag" Stipulations)

Green River-Hams Fork, Atlantic Rim Tract:

"In conducting the coal unsuitability review for the project area, portions of the Separation Creek and Muddy Creek drainages passing through or near the project area were identified as possible alluvial valley floor areas (coal unsuitability criterion number 19). These identified possible alluvial valley floor areas, or other areas near them where the proposed coal mining could interrupt or intercept water flow to farming areas along the drainages, may only be mined subject to mitigation measures for alluvial valley floor protection that are made a part of an approved mine plan. Determination of alluvial valley floor areas and mitigation measures (if possible) is usually made by the state of Wyoming at the mining lan approval and mine permitting stage."

SOURCE: Round II Draft EIS.

San Juan, PRLAs NM-3919, 3753, 3834, 3835, 11916:

"The lease contains high priority habitat for migrating birds of high Federal interest (Ferruginous hawk nest sites and buffer zones). . . . This area is unsuitable for surface coal mining operations unless the BLM and the Fish and Wildlife Service concur that surface coal mining will not disturb the birds during the breeding season."

SOURCE: Second draft EIS.

Fort Union, Southwest Glendive Tract:

"Reclamation: Intermixing of calcareous horizons would increase the salinity of the soil and make reestablishment of vegetation more difficult. Special handling of overburden, which would increase coal mining costs, may be required. More information is required, and the salinity problem should be resolved in the mining plan."

SOURCE: 1981 Tract Summaries.

more than one company had been interested in the Paonia D Seam, the competition might have been chilled by the idea of having to comply with lease stipulations negotiated by another company. Moreover, some companies feel that conflict resolution stipulations tend to be more detailed than other types, and thus unduly constrain flexibility at the permit review stage.

Permit conditions also can be used to resolve conflicts through public and interagency review requirements. However, the technical nature of the mine plan and permit application usually restricts such public review. Moreover, except in the few instances when an EIS is issued on a mine permit, the review period and geographic extent of notice of an opportunity to comment usually are limited.

Detailing Mitigation Techniques

Fourth, tract-specific lease stipulations and permit conditions are used to detail particular mining, reclamation, or mitigation technologies or methods. Thus, the lease stipulations for the Paonia D Seam tract in Uinta-Southwestern Utah specify water re-routing requirements (see Box D), and stipulations negotiated for the Circle West III tract in Fort Union provide detailed options for the recovery, replacement, or mitigation of wildlife habitat loss (see Box E).

Lessees and permitting agencies view lease stipulations that detail particular mining or mitigation techniques as **at least** redundant (when they repeat requirements that would be incorporated in the mine plan or imposed as permit conditions),

Box D.—Special Hydrological Stipulations Negotiated for the Paonia D Seam Tract, Uinta-Southwestern Utah Region

"(c) The lessee shall replace in a manner consistent with state law the water supply of any owner of a vested water right which is proximately injured as a result of the mining activities.

"(d) The lessee shall formulate a water replacement plan to replace the possible loss of water presently adjudicated and historically put to beneficial use in Coal Gulch, East Roatcap Creek, West Roatcap Creek, Stevens Gulch and Terror Creek. The water replacement plan for each respective drainage shall be developed after consultation with affected water right users, and federal and state authorities, and shall be approved by state authorities before mining in the particular drainage.

"(e) As part of each water replacement plan the lessee shall furnish information, to the BLM, which demonstrates its legal and physical ability to implement said plan. A source of replacement water may include, but is not limited to, the transfer of water rights, an augmentation plan, a long term water use lease, or compensatory storage.

"(f) In the East Roatcap Creek watershed, an acceptable plan (submitted as part of the mine plan) prepared in consultation with affected water right users, and federal and state authorities, shall be for the lessee to re-route the water in East Roatcap Creek diverted from the Overland Ditch, around the coal lease tract, In addition, the plan shall show that protection can be provided through supplementation, improvement of conveyance systems, or other comparable means, for East Roatcap Creek surface runoff water presently adjudicated and put to beneficial use which is subject to potential injury resulting from coal mining. The re-routed water which is presently released in East Roatcap Creek from the Overland Ditch, will be diverted to West Roatcap Creek (via Overland Ditch) and delivered to the original points of use without causing injury to the water quality, quantity, or timing. The re-routing of water shall be carried out before any mining occurs in the watershed which the water is currently conveyed and in a manner which avoids interruption of water delivery.

"(g) Coal extraction will be limited in buffer zones established along East Roatcap Creek and Stevens Gulch where the overburden is 600 feet thick or less in order to prevent all surface and subjacent disturbance to the overburden. If necessary, access entryways needed to extract the coal on the west side of these water courses will be permitted through the buffer zones. The buffer zones will include the above mentioned bank-full stream channels and the alluvial/colluvial fill associated with them. The angle of draw used to protect these areas from subsidence will be dictated by site-specific geologic and mining conditions (the estimated angle of draw for the Mesa Verde formation is 15 to 20 degrees). . . ."

"(i) The lessee, before issuance of the mine permit, will conduct and provide to BLM an inventory of all existing state adjudicated water rights in and adjacent to the lease tract which may be impacted by subsequent mining activities. At a minimum, this inventory will include: the water right holder, location, source, amount of decree, beneficial use, historical flow, and the appropriation and adjudication dates.

"(j) Existing cross-tract and on-tract water flows shall be maintained by the lessee even following release of the permit bond by the Colorado State Mined Land Reclamation Board. Compliance with this mitigation shall be assured by an increase in the BLM administered lease bond for a monetary amount and for a time period to be determined in consultation with state and federal authorities, affected water users, and the lessee. . . .

SOURCE: Coal Lease C-37210.

Box E.—Habitat Recovery and Replacement Plan Requirements for Unsuitability Criteria 15, Circle West III Tract

A. The lessee shall be required to mitigate for deer, antelope, and sharptailed grouse habitat loss where applicable and the resultant loss or displacement of these species due to surface coal mining operations.

The habitat recovery and replacement plan shall indicate the methods to be employed by the lessee which will ensure that the recovered or replaced land has the capacity to support these species, as determined by BLM in consultation with the State of Montana.

Mitigation methods may require the lessee to employ techniques for wildlife range management or intensive wildlife habitat range management. Habitat recovery or replacement may not be completely feasible in the permit area; therefore, recovery or replacement may be accomplished on lands made available through the surface management agency, the State, or the lessee outside the permit area in combination with recovery and replacement methods on suitable lands within the permit area. In addition, habitat enhancement may be undertaken, outside the permit area, to accommodate or compensate for those displaced species that will move from the mining area during disturbance.

The habitat recovery and replacement plan shall consist of at least the following five parts:

1. A habitat analysis of the permit area which:
   a. Identifies the state wildlife species of high interest listed in Paragraph A which occupy the permit area.
   b. Includes an analysis of the quality of the habitat for those species.
   c. Maps and identifies all riparian areas or mesic woody draws critical to the survival of these species.
2. A detailed description of the methods selected by the lessee to recover, replace, or mitigate habitat loss, together with a comparative analysis of alternative methods which were considered and rejected by the lessee and the rationale for the decision to select the proposed methods.
   The methods utilized by the lessee for recovery and replacement may include, but are not limited to, any of the following techniques;
   a. Increasing the quantity and quality of forage available to these wildlife species.
   b. The acquisition of critical wildlife habitat for the identified species.
   c. Mechanical manipulation of low quality wildlife habitat.
   d. Recovery, replacement, or protection of critical wildlife habitat by selected fencing.
   e. Development of a grazing management system that will enhance the wildlife habitat potential.
3. A timetable specifying that period which will be required to accomplish the habitat recovery or replacement plan and showing how this timetable relates to the overall mining plan.
4. An evaluation of the final plan by the BLM in consultation with the State of Montana. The State and BLM may comment on the methods selected and the techniques to be employed by the lessee and may recommend alternative recovery or replacement methods. If there are recommended alternative methods, the lessee shall consider those recommendations, and, if the lessee rejects them, the lessee shall indicate its reasons as required by provision 2, above. If no State or BLM comment is included in the plan, the lessee will provide verification of its consultation with these agencies and the plan may be considered without comment.
5. In the development of this plan, direct liaison with the State of Montana is essential.

B. The stipulations set forth herein are not, in any way, intended to conflict with nor preempt the responsibilities of the Department of State Lands, nor any other state or federal agency regulating surface coal mining and reclamation. Lessee shall comply with all valid and applicable laws and regulations of federal, state, and local governmental authority.

C. The authorized BLM officer shall provide written approval of the plan to the lessee. Resolution of conflicts during development of this plan will be brought to the attention of the authorized officer. Failure to resolve the conflicts or comply with agreements worked out under this plan will constitute noncompliance as described in section 21 of the coal lease.

SOURCE: Reference 86.

and **at most** as usurping the permit agencies' authority to make findings under SMCRA about technical and economic reclamation potential and methodologies. In all cases, such lease stipulations, if not renegotiable at the permit application review, may remove the flexibility needed to adapt to new data and changes in technology and methodology (e.g., the ability to move eagles' nests). Detailed technical lease stipulations that incorporate quantitative standards also tend to limit the permitting agencies' and lessee's ability to adapt to changing conditions or new information.

Excluding Areas From Mining

Lease stipulations or permit conditions can be used to exclude areas from mining (or from certain types of mining). In some cases, avoidance measures relate to particular areas within a leased tract. For example, lease stipulations or permit conditions might establish buffer zones around sensitive areas such as wildlife habitat, which may be absolute, seasonal, or conditioned on wildlife presence, or might specify particular types of impacts that are not allowed on leased tracts (e.g., "no surface disturbance," which usually means underground mining only; or "no surface occupancy," which extends to portals and other surface facilities associated with underground mining). Alternatively, avoidance measures can be used to adjust tract boundaries prior to leasing, either through application of unsuitability or multiple-use screens, or through an explicit decision to avoid mining (e.g., deletion of the two sections of the Dunn Center tract in Fort Union that contain portions of the Knife River Flint Quarry).

Controversy has arisen over the difference between lease stipulations that declare areas unsuitable for mining (whether as a result of the unsuitability/multiple-use screens or other decisions) and those that permit mining but require mitigation of impacts. When the parties to a leasing decision disagree about the ability to mitigate impacts or the reclamation potential of an area, environmental and other public interest groups would prefer to see the area excluded from mining altogether, while operators expect the area to be carried forward and a final decision made on avoidance versus mitigation at mine plan review, when extensive data on potential impacts and alternative mining and reclamation techniques are available.

Summary

Because of the numerous means and opportunities for mitigation, many of the participants in leasing argue that the coal management program is unduly biased toward environmental protection. Proponents of the "environmental bias" in the program argue that multiple pre-lease mitigation reviews are necessary as more and more data become available, because post-leasing decisions are more likely to accommodate mining. They note that a successful mitigation program also will allow coal producers and users to make more timely and secure development plans, and that the principal emphasis of the leasing program continues to be to produce an adequate amount of coal.

DOI responds that it should be responsible for determining, with reasonable certainty, that a specific tract can be developed without severe or permanent harm to the environment and for determining the stipulations needed to ensure this protection prior to lease sale, rather than waiting for this determination to be made at the mining plan stage. As noted in the 1979 Programmatic EIS:

> Often at the time of issuance or continuance there is insufficient information about proposed operations to assure stipulations will cover all problem areas. Therefore, when an operations plan is submitted, stipulations are reviewed and revised or added to make them fit the specific situation as closely as possible (3).

OTA found that both lease stipulations and permit conditions play a valid role in assuring that Federal coal is developed in an environmentally compatible manner. Lease stipulations can be valuable for alerting bidders and the permitting agency to potential problems on a tract that were not within the purview of pre-lease analysis (e.g., potential cumulative hydrologic impacts). Although such stipulations may only repeat concerns these parties already recognize, they demonstrate BLM's awareness of these problems, and thus also confirm for members of the public and interest groups that the impacts will be addressed at mine plan review. However, there seems to be little point in stipulations merely duplicating requirements of either SMCRA or the States' permitting programs.

Stipulations also can be valuable as a form of conflict resolution. However, care must be taken to ensure that all interested parties are included in the negotiations, or, conversely, that no potential bidder who might become obligated to comply with those stipulations is excluded from the negotiations. Therefore, negotiated stipulations are most appropriate for noncompetitive leasing situations.

In OTA's view, mitigation measures requiring data collection have a limited usefulness. If sufficient data are available pre-lease to make an informed decision about environmental compatibility, then lease stipulations for data collection should be unnecessary. On the other hand, if sufficient data to make a pre-leasing decision are not available, then the schedule could be delayed or the tract not offered until the data are collected. If it is not a decision that should be made pre-lease (e.g., cumulative hydrologic impacts), then a "red flag" stipulation probably is more appropriate than one requiring data collection.

When data-related stipulations are considered necessary, they should be designed to enhance the decisionmaking capability of the permitting agency. For example, in one instance, BLM, OSM, and the State of Montana worked together to develop a lease stipulation that addressed a hydrologic problem identified in the pre-leasing stage. In this case, BLM stipulated that the lessee include at least 3 years of baseline hydrologic data in the permit application rather than the 1 year required by the State's guidelines.

Similarly, the current policy of using as few permit conditions as possible, by requiring issues to be resolved in the mine plan before a permit is issued, probably provides the best basis for environmentally sound decisions. An exception, mentioned previously, is when monitoring of mining operations is needed to better understand potential impacts before permit conditions are tailored to those impacts.

Finally, it should be noted that, while a high level of detail and specificity may not be appropriate in stipulations related to particular mining or reclamation methods, clear and specific language is needed in all types of stipulations and permit conditions. As found in a previous OTA report on pre-1979 leases:

> Mineral explorers and developers under the leasing laws face substantial uncertainty as a result of the vague and general wording of almost all the lease provisions . . . concerning nonmineral resource protection (17).

DEFERRAL OF DECISIONMAKING

The insufficient time available for pre-sale planning and environmental analysis (see discussion of lease rates) has meant that BLM had to continue many activities beyond the time when they were scheduled to be completed, and thus to defer decisions that depend on those activities or to impose mitigation measures in lieu of making decisions. Such deferrals undermine the tiered structure concept of data collection, planning, and analysis, which cannot function as intended under these conditions. This raises the more basic question, at what stage in the process should environmental compatibility decisions be made, and at what level of detail.

As described in the section on "Data and Analysis," the tiered structure for pre-lease planning and assessment incorporates unsuitability determinations and multiple-use tradeoffs (as well as estimates of coal development potential and surface owner consultations) during land use planning; site-specific analyses and the publication of tract profiles, tract ranking and the selection of leasing alternatives, and preparation of a regional lease sale EIS for those alternatives, during activity planning; Secretarial review prior to the leasing decision; and preparation and review of a mining and reclamation plan. Each of these environmental reviews has a different purpose and focus, and the quantity and quality of resource data generally increases at each stage of review while the amount of land being evaluated decreases as the land moves closer to development.

The program regulations governing land use planning allow the application of the unsuitability criteria to be carried over to activity planning if sufficient data are not available to make final unsuitability determinations earlier. "Acceptable pending further study" was BLM's unsuitability decision, for example, for the many of the wildlife habitat areas identified during land use planning when additional data were needed to determine the importance of that habitat. However, significant data material to application of 19 of the 20 criteria* (or the exceptions to them) on a tract must be available before it can be analyzed in the final EIS for a lease sale. If such data are not available for a portion of a tract, but BLM feels that lease stipulations or permit conditions could resolve any problems which may result from application of a criterion (or exception) after the EIS, then the whole tract may be carried forward.

For the coal areas considered in this report, BLM believes that all data were adequate to justify leasing decisions (6). However, BLM frequently did not utilize all existing data sources available to them (i.e., State reclamation experts, mine plan data from mining operations adjacent to a tract), and planning and analysis schedules were often so tight that they precluded detailed field assessments by multidisciplinary teams of experts. As a result, BLM made extensive use of the option of deferring unsuitability determinations to activity planning or beyond.

If sufficient data were not available during land use planning, final decisions on the multiple-use and unsuitability screens could not be made. When land use decisions were deferred to activity planning, the time originally allotted to that planning became compressed (unless the schedule for the EIS was allowed to slip, which has not been the case in recent sales). As a result, less time was available for site-specific analysis. Furthermore, after tract delineation, data collection in support of planning tends to become focused on specific tracts rather than on a wider area of Federal lands, which can preclude development of a sense of the relative regional value of environmental resources (see section on "Data and Analysis").

OTA found that deferral of decisions from land use planning to activity planning detracts from the predictability and effectiveness of the tiered structure concept of data and analysis; in that the amount of land to be evaluated at the seond tier does not decrease as much as anticipated, and site-specific analyses have to be performed for a greater number of tracts than originally included in the planning schedule. This strained BLM resources and meant the SSAs were not as thorough as might have been desirable for informed decisions on environmental compatibility. As a result, there was an increased risk that environmentally sensititve tracts would be offered for lease. In many cases, decision deferrals are directly attributable to high leasing rates, which impose tight planning schedules and pressure BLM to find more tracts environmentally compatible. OTA also found that deferral of decisions from BLM planning and environmental assessment to mine plan review increases the probability (i.e., risk) that tracts with sensitive environmental characteristics will be mined, and promotes the overuse of lease stipulations.

The extent to which decisions were deferred varied widely among the regions (see table 13). In Uinta-Southwestern Utah, the Colorado portion of the North Fork Planning Area was not evaluated for leasing in the Round I lease sale because BLM considered the existing land use plans to be inadequate to provide a basis for application of the unsuitability criteria and other screens (7a). There was little industry interest to justify updating the MFP, and BLM felt the socioeconomic impacts of further coal development in the area would be excessive (6). In the San Juan River Region, however, the MFP was considered adequate until publication of the first draft EIS, was criticized widely for data inadequacy, especially on cultural resources. A second draft EIS was prepared for the pending Round I San Juan sale (a highly unusual occurrence) with a class II cultural resources survey—a 10 to 25 percent on-the-ground survey—reportedly completed between

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*In the case of the alluvial valley floor criterion, unsuitability determinations can be deferred to the mine plan stage.

Table 13.—Number of Tracts for Which Decisions on Unsuitability Criteria Were Deferred Past Land Use Planning[a]

Region and sale: (no. of tracts)	Critical winter range for big game	Threatened and endangered species	Other wildlife criteria	Alluvial valley floors[b]	Cultural resources[c]	Flood plains	Municipal watershed	"Buffer zones"[d]	Special management areas
Fort Union:									
Round I (23)[e]	0/0/4	0/0/23	0/0/22	8/0/0	9/0/10	0/0/4	0/0/0	23/0/0	0/0/2
Powder River:									
Round II (20)[e]	0/0/0	0/11/0	0/1/0	14/0/0	0/20/0	0/0/0	0/0/0	0/0/3	0/0/0
Green River-Hams Fork:									
Round I (16)[f]	0/7/0	0/0/3	0/0/12	14/0/0	0/13/2	0/0/9	0/0/1	0/0/3	0/0/0
Round II (24)[f]	0/7/0	0/12/0	0/7/0	4/1/0	0/6/0	1/1/1	0/0/0	2/1/1	1/0/0
Uinta-Southwestern Utah:									
Round II (27)[f]	0/2/0	0/1/0	7/7/0	6/0/0	0/4/0	4/7/0	0/7/0	0/4/0	1/1/0
San Juan River:									
PRLAs (26)[f]	0/0/0	0/0/0	0/5/0	0/0/0	0/13/0	19/0/0	0/0/0	0/15/0[g]	0/7/0
Competitive (39)[f]	0/0/0	0/0/0	0/0/0	0/0/0	0/1/8	0/39/0	0/0/0	0/0/0	0/0/5

NOTE: OTA confidence in the numbers in this table varies widely among regions due to variability in quality of BLM documentation on application of the unsuitability criteria. Actual figures may be higher.

[a] Numbers indicate: decisions explicitly deferred to OSM or State regulatory authority/decisions deferred through lease stipulations/decisions requiring additional data.

[b] All tracts with potential AVFs in each region were deferred.

[c] Tracts with special notations or provisions; BLM standard lease form requires cultural resource inventory on all tracts prior to development.

[d] Includes criteria 2 and 3 as well as buffer zones for wildlife, etc., when explicitly deferred.

[e] Source is Tract Summaries.

[f] Source is draft EIS (second draft for San Juan Region).

[g] For gravesites, applies to all 26 PLRAs.

SOURCE: Office of Technology Assessment from Bureau of Land Management documents noted.

the first and second draft EISs to allow application of unsuitability criterion #7 (historic and archaeological sites). Also in San Juan, final application of unsuitability criterion #9 (threatened and endangered species) has been deferred pending the completion of field surveys to determine whether any such species are present. PRLA lease stipulations in San Juan contain a caveat that archaeological surveys are not complete and that sites considered unsuitable under criterion #7 may still be found (7).

In general, the more complex the environmental issue (e.g., reclaimability of alluvial valley floors, impacts on hydrology), the more data and analyses are required to resolve the issue, and the more likely that resolution will be deferred until later in the leasing process, or to the mine plan stage. Some of the environmental characteristics of potential lease tracts may change over time (for instance, the active status of eagle nests), and BLM is reluctant to find lands with such characteristics to be unsuitable for leasing.

The deferral of decisions intended to be made during land use planning illustrates the manner in which high lease rates have forced BLM to become "issue driven." Given the time and other constraints on data collection and analysis, planning tends to focus on areas that must be evaluated because of industry interest in leasing, and tends to be considered adequate if it generates little controversy rather than meets any standards or guidelines for adequacy. Although the level of controversy is one valid measure of the adequacy of data, it should not be the only measure. Other measures of the adequacy of pre-sale planning and data include the extent to which gaps in the data base necessitate the use of detailed lease stipulations or the deferral of decisions beyond the time at which they are scheduled to be made.

Although few tracts were included in a final EIS for the recent lease sales without final unsuitability determinations having been made, documentation of those determinations in the EIS was not always sufficient to judge whether the supporting data and analyses were adequate (e.g., a simple statement that "application of the unsuitability criteria has been completed"). Furthermore, BLM made extensive use of the exemptions/exceptions to the criteria, and of lease stipulations intended to accommodate data inadequacy. For example, in the Green River-Hams Fork region, application of criterion *#15* (important wildlife habitat) resulted in BLM imposing lease stipulations that require the lessee to include in the mining and reclamation plan the proposed means of managing species habitat requirements offsite during the mining process (4a). Sometimes, as with hydrology, the stipulations can be far more complex and specific (e.g., the Paonia D Seam tract; see Box D). Lease stipulations can be nothing more than an alternative means of deferring difficult decisions to the mine plan stage (e.g., when the stipulations "flag" areas of concern or require data collection and analysis). Such mitigation measures would not have to be used so extensively if more complete data bases were available (see section on "Mitigation Requirements").

Deferral of data collection to the activity planning stage does not necessarily mean that a tract will survive the pre-lease planning process. Some tracts with significant wildlife habitat, alluvial valley floors, or other unsuitability conditions have been "flagged" during land use planning, and then dropped from further consideration for leasing (or not included in the preferred alternative) when additional resource information collected prior to the lease sale demonstrated unsuitability (e.g., the Bitter Creek tracts in the Powder River region and the Mud Creek and North Trough tracts in Uinta) (10b; 10c). Other tracts that survived land use planning were reduced in size as a result of BLM's considering an unsuitability criterion after more resource data became available during activity planning (e.g., Renners Cove in Fort Union) (8b).

Deferral of decisionmaking raises the question of when during the tiered coal management process is it most appropriate to assess the impacts of coal mining. No consensus emerges as to the role of pre-lease environmental analysis. Some argue that unless a tract contains a "fatal flaw" that would absolutely preclude mining, BLM should flag potential problems to signal that additional data need to be collected later in the process—either during activity planning or at mine plan review. This supports current departmental policy to let the marketplace determine which tracts are desirable for leasing. Others argue that if BLM does not have sufficient data and analysis to make a fully informed decision about the environmental compatibility of the potential lease tract, then that tract should not be offered.

The coal industry believes that the current process for environmental review works. They argue that few potential lease tracts contain "fatal flaws" and those that do have been screened out during land use planning by the unsuitability criteria or the resolution of multiple-use conflicts. The industry feels that the current process is appropriate because most areas (except for those with fatal flaws) can be mined and reclaimed in an environmentally compatible manner; it is a question of how much mitigation and reclamation will cost—a decision which should be up to individual companies, according to the industry.

Therefore, the industry believes that most final decisions on environmental compatibility should be made at the permitting stage, when the most comprehensive data on environmental resources and mitigation techniques are available. They contend that the combination of mining and reclamation plan review and approval, plus permit conditions, post-permitting inspection and enforcement, and reclamation bonds, is sufficient to ensure that leases are developed and reclaimed in a manner compatible with environmental laws and regulations.

Critics of the current leasing program recognize that comprehensive data on environmental values are not available until the permitting stage, but they believe that, if BLM were to perform its data gathering and analysis functions adequately (see discussion of Data and Analysis), then a larger number of tracts—including areas that are considered environmentally sensitive, but may not have "fatal" flaws—would be screened out during land use and activity planning and the EIS process than is currently BLM practice. They cite the Otter Creek tracts in Powder River, and Atlantic Rim in Green River-Hams Fork as examples. Moreover, critics note that decisions during mine permit review are more likely to impose mitigation requirements than to close areas to mining, and that mine permit applications historically have not been denied. They argue that all of these considerations force them to seek either a political or judicial resolution of disputes with BLM over the adequacy of pre-sale data and planning.

State government views regarding the appropriate time to make decisions on environmental compatibility vary. Some States have adopted an environmental posture and agree that more tracts (or portions thereof) should be eliminated earlier in the process. Other States are more development oriented, or want to make such decisions themselves, and prefer that tracts be carried forward and potential conflicts resolved through mitigation measures developed by the State at the mine plan stage. Wyoming officials pointed out that besides participating on the RCTs, that State has two other opportunities to screen out problem tracts—when the company applies for an industrial siting permit and when they apply for a surface coal mining permit (10b).

The BLM believes that their current implementation of the tiered process is adequate. They note that data on environmental conflicts necessarily are incomplete prior to the submission of a mine plan but that the leasing program (including RCT activity) ensures that tracts which could not be mined are not leased. BLM staff pointed out that their regulatory mandate is to do the best job possible using available data. They acknowledge, however, that in some instances, pre-lease analysis could be improved so that fewer decisions are deferred. As a result, BLM places heavy reliance on lease stipulations and the mine plan review process to prevent the mining of any unsuitable areas that make it through the pre-lease screens.

It is clearly in the best interests of all participants in coal leasing to eliminate tracts that are not minable as early in the process as possible. However, issues such as reclaimability, air quality, and many hydrologic concerns, are, in many instances, simply too complex to resolve prior to leasing. The comprehensive detail of a mining and reclamation plan and the specificity of the baseline studies that accompany that plan provide a better basis for informed decisions on such concerns. The "red flag" approach to problem identification at the pre-lease stage sends both the regulatory agency and industry a signal as to where some of the permitting difficulties may lie and hence where more intensive data-collection efforts will be necessary.

For most environmental issues, however, even difficult decisions can be made pre-lease with less than mine-plan level information. Yet, in the current program many of these decisions are deferred to the mine plan due to lack of time, budget, and staff to evaluate them adequately prior to leasing, or as part of overall departmental policy to allow the market to determine which tracts are desired for leasing.

REGIONAL COAL TEAMS

One of the most innovative aspects of the coal management program established in 1979 was the creation of the Regional Coal Teams. The RCTs are BLM/State organizations made up of a representative of the Governor from each of the two States in a coal region, the BLM State Director for each State involved, and the chairman, who is a BLM State Director from a State outside of the region. Thus BLM maintains a voting majority on each RCT. The RCT can have ex-officio nonvoting members from other Federal land management agencies such as the U.S. Forest Service or Bureau of Indian Affairs, or from other State agencies if the Governor so requests.

The RCTs play a role in policy formulation for all aspects of the coal leasing program and provide specific recommendations on leasing decisions to the Secretary of the Interior. The RCTs consider and suggest policies or practices for regional production goals and lease levels, tract delineation, and site-specific analysis. Specific recommendations, based on votes, are to be made by the RCT on: tract delineation, adequacy of site-specific analysis, tract ranking, tract selection, leasing levels, lease sale schedules, and the development of alternatives for analysis in the EIS, including selection of the preferred alternative (see table 14). The views of any State member, if different from the RCT decision, are to be documented, and alternative recommendations are to be treated equally in the regional coal lease sale EIS, which becomes part of the Secretary's final decision materials on the lease sale.

The RCT concept allows the States to participate in the leasing program on an ongoing basis as well as in a setting less formal than the Secretarial consultation with the Governors required under FCLAA. This ongoing participation is strengthened by procedures allowing affected State agencies to participate in site-specific analysis and tract ranking.

The role and the makeup of the RCTs are supported by the Governors of the participating States. A recently proposed regulatory change that would have removed recommendations on the leasing level and the identification of the preferred alternative for the EIS from the purview of the RCTs was strongly opposed by the States, and was dropped.

The RCT framework also offers citizens of State and public interest groups an authoritative forum for expressing and discussing concerns. In some instances, the RCT has served as a focus for public participation. However, the public generally is more familiar with the NEPA process than with the RCTs, primarily due to the longer and better publicized history of NEPA compared to the just recently initiated Coal Teams. However, if the RCT process were better understood, its potential for effective public participation may hold greater promise than that of NEPA alone, because the RCT's activities span a greater breadth of the coal program activities, one of which is the formulation of the alternatives to be analyzed in the EIS.

On several occasions, interested parties have proposed expanding membership of the RCT. Other Federal land management agencies have sought to gain voting representation where their

Table 14.—Summary of Tract Rankings by Regional Coal Team, Green River-Hams Fork, Round I[a]

	Ranking factors[b]				
Tract	Coal economics	Environmental	Social-economic	Summary ranking	Comments
Bell Rock	Medium	High	High	State-high BLM-medium	Logically part of larger tract. Leasing now may commit development of the larger tract.
Empire	Medium	High	High	High (assumes rail transportation)	Underground mine. Logical extension of two adjacent mines. Could become bypass tract if not leased.
Grassy Creek	High	High	High	High	Small tract, possible set aside. No particular problems evident.
Pinnacle	State-med/low BLM-med/high	High Low	High High	State-high BLM-med/low	As delineated, contains 80 acres of sharp-tail grouse habitat that was determined "unsuitable" in land use planning. Unsuitable area has since been deleted from tract.
Danforth I	High	State-medium BLM-high	High	High (assumes rail transportation)	Northeast part of tract may become bypass if not leased.
Danforth II	High	Medium	State-medium BLM-high	Medium	Cumulative impacts would be severe if Danforth II were developed concurrently with Danforth I and III, and the Colowyo mine. Concern with wildlife impact if all Danforth tracts are developed.
Danforth III	High	State-medium BLM-high	High	High	About 30 percent of population resulting from Danforth tracts would be expected to go to Meeker. Only tract in Rio Blanco County to contribute to tax base there.
Hayden Gulch	High	State-low BLM-high	State-medium BLM-high	State-medium BLM-high	Significant wildlife range—more easily mitigated than Williams Fork Mountain. High competitive interest.
Lay	State-medium BLM-high	State-low BLM-medium	State-low BLM-high	State-low BLM-high	State ranked as least desirable of Colorado tracts because of transportation system concerns. Possibility of population impacts to Maybell. BLM believes railroad will be extended from the east. One of the most competitive tracts due to its isolation from existing operations. Alluvial valley floor divides tract.
Isles Mountain	Medium	Low	State-medium BLM-low	Low	High air quality impacts. (Assessment has since changed.) Low coal recovery. Eagle habitat in sections 3, 10, 11.
Williams Fork Mountain	State-low/med BLM-medium	Low	Medium	Low	Relatively low coal yield. No railroad access. Critical winter range area.
Rosebud	High	Medium	High	High	
Medicine Bow	High	High/medium	High	High	
Seminoe II	High	High/medium	High	High	
Red Rim	Medium/high	Medium	High/medium	Medium (high if leased with China Butte)	
China Butte	High	Medium	High	High	

[a] It should be noted that this is an extremely detailed summary of tract rankings. Few summaries break rankings down by subfactors or document disagreement between Federal and State RCT members.
[b] High, medium, or low refers to desirability of leasing/development.

SOURCE: Bureau of Land Management, *Green River-Hams Fork Final Environmental Impact Statement: Coal*, vol. I, August 1980.

interests are affected (e.g., the Forest Service where federally owned coal underlies National Forest Lands). Similarly, some groups have proposed that affected Indian Tribes be given voting membership (especially the Navajo in the San Juan region). Representation by other constituent groups (e.g., industry, environmental organizations, local landowners) also might be considered. Such basic changes in the structure of the RCTs would be difficult to negotiate. Moreover, it is possible that these interests could be addressed adequately without voting membership if the role of the RCTs were broadened to cover the entire leasing process, and Task Groups (or similar approaches) involving all interests were used more frequently.

A broadened membership that included representation from all interested parties would likely result in a group that resembles the Oil Shale Advisory Panel. While this panel has served as a useful forum for the discussion of the broad range of issues involved in oil shale development, and such discussions have resulted in the focusing of governmental and industry efforts on key issues, it does not have the directed mandate and stature accorded the RCTs.

Actions by RCTs

While the general mandate is the same for all RCTs, there is some flexibility provided so that approaches and decisions can be tailored to the specific regions. For instance, with respect to the ranking of tracts, the RCT can define the three major factors (coal economics, impacts on the natural environment, and socioeconomic impacts) in terms appropriate to the region. Further, these rankings can be adjusted to reflect locally important considerations such as socioeconomic impacts.

There is some variation in how the RCTs are structured. For instance, Colorado has included representatives from local communities as ex-officio members of the RCT. Local concerns with the socioeconomic impacts of coal development as well as with other issues thus are presented first hand. In contrast, Wyoming's RCT member conducts field investigations with all potentially affected communities and then represents their interests as part of the State's position.

On the Federal side, coordination with other land management agencies requires flexibility. The Forest Service manages large areas of land overlying Federal coal reserves in Utah, and the synchronization of the two agencies' (BLM and the Forest Service) planning schedules might reduce conflicts between surface uses and mining.

Broadening the scope of RCT activities to cover the entire coal leasing program, especially any decisions made during land use planning that support leasing activities (e.g., application of the unsuitability criteria), could improve the quality of those decisions due to greater involvement of knowledgeable State personnel and reduce the potential for conflict between the States and BLM. This could alleviate any controversy that may arise when the land use planning decisions are presented to the RCT at activity planning and later stages. Involving the RCTs in land use planning also would be consistent with BLM's objective of substituting Resource Management Plans (RMPs) for updated or amended MFPs as the land use plan. Since many of the State representatives on the RCTs are from agencies with broad natural resources management responsibilities, broadening the scope of the RCTs should not require changes in State memberships.

However, expanding the role of RCTs would involve greater commitments of technical staff from BLM and State agencies. Providing additional funds to support greater State involvement in the RCT process would improve its effectiveness (present Federal funding for State RCT activities is limited to members' travel expenses for attendance at meetings). It is envisioned that most of this support would be for technical staff assistance to the State representative for analyzing pertinent issues and preparing adequate documentation for inclusion in the various coal management program documents. Funding could be provided through direct grants to the States, as part of the coal management program budget, or in part through existing grants for related activities, such as the cooperative agreements for regulation of coal mining on Federal lands (30 U.S.C. 1295).

RCT Task Groups

Other approaches have included formally organizing Task Forces to evaluate specific issues and report on them to the RCT. The San Juan Regional Coal Team has established task forces on several issues including the valuation of PRLAs and BLM/BIA coordination of data collection and unsuitability determinations on Indian lands. Because much of the coal land to be leased in New Mexico is within PRLAs, the economic and environmental consequences of processing the PRLAs could be dramatically different compared to holding competitive lease sales. Although questions and comments from the public are usually accepted during the task force meetings, notice of those meetings may not be publicized as widely as might be desirable for maximum public participation.

Task groups also can be specific to individual RCT members. For instance, the Utah Mineral Lease Task Force (MLTF) was created by the Governor of Utah and is composed of representatives from all the State agencies (and their constituents) whose programs are affected by or otherwise relate to coal leasing and development. In addition, representatives from local communities affected by coal development participate on an ex-officio basis. Other interest groups that are involved in the process include other affected Federal agencies, the industry, environmental groups, and Indian tribes. The MLTF reviews all issues involved with coal leasing and development from Utah's perspective, and makes recommendations to the Governor as to Utah's position on issues before the RCT. A broad range of issues and interests is considered by the MLTF including: evaluation of the coal resource, mining and reclamation potential, application of unsuitability criteria, and socioeconomic impacts. The MLTF process also helps to assure coordination and consistency between Federal lands actions and State and local land-use plans, a requirement under FLPMA.

The MLTF is the focal point within the State for developing a consensus on the issues and problems addressed and how the State's perspective is to be maintained within the context of the RCT deliberations. The MLTF activities have been extended to cover the same types of considerations involved in oil shale and tar sands development and leasing.

Role of BLM Within the RCT

The BLM State Director has some discretion with respect to the number of activities assigned to the RCT for consideration and to the information provided to the RCT. BLM personnel serve as staff to the RCT, which ensures the RCT has access to the same information available to the Secretary and provides more resources than would be possible if State agencies performed RCT staff functions. However, the concerns of State RCT members may be different from those of Federal members, and concerns have been raised about RCT/BLM staff not providing support for positions different from those held by Federal RCT members. Moreover, serving as RCT staff does not carry any career incentives, which may lead to work for the RCT being assigned a low priority compared to other duties that are considered in merit evaluations.

The RCT as a Forum for Public Participation

A wide range of approaches has been used to involve the public in the RCT process. At one end of the spectrum are the various task groups which include a broad representation of interests. Actual participation in task groups provides an opportunity for substantive dialog among the parties and a potential to forge a consensus (if not an understanding) that will allow the leasing process to proceed without challenge. At the other end of the spectrum are those instances when public participation was limited to an opportunity to offer comments at the conclusion of a formal RCT meeting. Such limited participation generally is not considered meaningful or substantive and is more likely to result in frustration with the leasing program.

The RCT process also could be strengthened by providing greater visibility to the team's recommendations. This might be achieved by assuring that recommendations are written and include supporting analysis and documentation as well as the basis for support within the region and how issues have been resolved; in short, the consensus developed. These recommendations should be publicized widely in the affected coal region and distributed to all individuals and groups that are concerned with the program. Similarly, more systematic procedures for involving the public in the RCT processes and becoming the focus for building consensus on program decisions would increase the visibility of the RCT recommendations.

PUBLIC PARTICIPATION

Public participation is an integral aspect of the Federal coal leasing program, both in law and under the present regulatory structure. In the broadest sense, the term "public" is a collective one which essentially encompasses all parties that are not specifically tasked by Federal or State law with responsibility for pre-lease planning. Thus, the term includes private surface owners, Indian Tribes, local governments, coal companies, electric utilities, academicians, environmental groups, archaeologists, paleontologists, farmers, ranchers, hunters, recreational participants, business owners, and virtually any other interested group or individual.

The importance of effective public participation is stressed in the laws—FLPMA and FCLAA—and regulations that govern the program, as well as in more general statutory mandates such as NEPA. Yet a number of criticisms have been raised about the number and scope of opportunities for the public to address coal leasing related concerns, the timing of those opportunities, the relative ability of different segments of "the public" to address their concerns, the quality of documentation by BLM to enable the public to evaluate pre-leasing decisionmaking, and the extent to which public participation is considered by BLM.

Public review and comment occurs essentially in two discrete phases. First, the mandated interagency participation includes both Federal and State agencies for which the program provides distinct opportunities for review and comment. This phase includes comment from agencies such as the Forest Service and Fish and Wildlife Service, as well as other agencies which do not have land management responsibilities related directly to coal leasing. Regulations require that BLM coordinate, during the development of land use plans, with other Federal agencies (e.g., Forest Service), State and local governments, and Indian Tribes (43 C.F.R. 1601.4). During the development of regional leasing levels or targets, the advice of Governors of the affected States must be considered.

After tract selection and ranking, but before adoption of specific lease sale schedules, consultation with Governors and Indian tribes must take place again. Under the August 1983 revisions to the regulations, Interior is required to seek recommendations of the Governors of States affected by lands proposed for lease and to accept these recommendations if "they provide for a reasonable balance between the National interest and the State's interest."

The second phase includes all groups and individuals who provide comment and review to BLM as part of the series of public hearings which are held specifically to solicit public input. While public participation and consultation with parties outside of the Federal Government are not strictly environmental protection provisions, several Federal laws have included them, in part, in the belief that such activities are useful in devising environmentally sound coal management policies. Several opportunities for public participation are contained in land use planning regulations. They require the publication of a planning schedule early in each fiscal year. When a new RMP or an amendment or revision to a land use planning document is begun, Federal Register notice to the public is required, and BLM is required to maintain a list of individuals and groups known to be interested in land use planning and activities. Fifteen days notice is required for public participation opportunities and a 90-day comment period is initiated upon publication of draft EISs. The public is allowed to comment on the identification of issues at the beginning of land use planning, and to review proposed planning criteria, RMPs, and significant changes made to the plans as the result of a protest.

The 1979 regulations allowed the public to comment at two points in the development of activity planning and the setting of leasing levels, and required that RCT analyses of production goals be based, in part, on these comments. A notice of intent to rank tracts was required in the Federal Register and public comments on proposed tract rankings had to be considered in regional EISs. Under the 1982 revisions to the regulations, all of these public participation channels were eliminated with the exception of the comment periods required under NEPA after publication of draft EISs.

Public Understanding of the Leasing Process

A basic obstacle to effective public participation is that the public generally does not fully understand the entire Federal coal leasing program, including BLM's pre-sale planning process. In general, the basic purposes and goals of the staged environmental review process are ill-understood by those not actually participating in it on a regular basis. The terms "land use planning," "multiple-use tradeoffs," "unsuitability criteria," "activity planning," and others are confusing, and by their very nature intimidating to people who are not already familiar with the general concepts. One major element of the coal management program not understood by many people is that the leasing of a tract by BLM is not the last opportunity to evaluate potential effects that may result from coal development. Many are unaware of surface mining permit applications and the level of detail with which mining and reclamation plans address environmental impacts.

The public's desire to understand and participate in the Federal leasing process is hindered by the fact that many States, which address major issues, do not necessarily provide mechanisms for the public to participate in all programs, such as water rights. As a result, the interested public tends to a certain extent to concentrate on the opportunities in the Federal programs that are available for them to address their concerns. As a consequence, some of the information provided by the public may not be directly relevant to BLM's jurisdiction. In some instances this results in the appearance that BLM has failed to consider public comments in making leasing decisions; in others, public persistence has resulted in BLM's "jurisdiction" being expanded (e.g., water rights issues in Uinta). This, too, is partially explained by the public's general lack of understanding about the planning process. **Workshops** at the outset of each of the planning stages could provide the public with a mechanism to be educated about the leasing process. **Brochures** that describe the basic steps, goals and products of the leasing process, and the means of public participation at each step also would improve public understanding. **Periodic newsletters** to inform the public of upcoming activities and past decisions would provide further explanation. All three of these mechanisms—informational brochures, a newsletter, and informational meetings—were used in Fort Union Round I (3a).

Public input is more effective for all concerned when it occurs as early in the process as possible. BLM sometimes receives insufficient public input early on, particularly for cases in which the public gets very involved in the later stages of the decisionmaking process. In some instances, public hearings go virtually unattended. Again, this is due in part to the poor understanding that the public has of the leasing process. The importance of addressing concerns as early as possible is generally not widely appreciated among the public. However, even early effective participation can be undermined by lack of continuity among BLM personnel.

Others argue that the permitting stage has ample opportunity for public concerns to be addressed in detail. In response, public interest groups claim that when the land is already leased, it is much harder to have decisions altered. In addition, participation in the process at the mine plan review stage is felt to be more difficult than in pre-leasing stages.

BLM's documentation on some of its procedures has been incomplete—another hindrance to the public's participation in the process. Unless the public can track specifically how a resource use decision was made or an unsuitability criterion applied, the ability to participate actively in the process is diminished, and interested parties are unable to determine whether BLM has satisfied legal and regulatory requirements. Revisions to the coal leasing program since 1982 changed the requirements for written documentation of application of screens in land use (or activity) planning. Without the more complete documentation required by the earlier regulations, public involvement in, and understanding and evaluation of, BLM's decisionmaking processes has been impeded.

Existing documentation also has been criticized as being too technical in the way it treats some issues, yet, at the same time, being too general and vague in not explaining the procedures that were followed. Compounding this is the undue length of some documents. Inconsistencies also are a problem for outside reviewers. Even within regions, the extent to which procedures are documented varies, and information in one document may not be consistent with others.

The availability of planning and leasing documents also presents problems. In some instances, documents such as MFPs are not published, or public copies are not always at easily accessible locations. Consequently, some interested parties have been precluded from reviewing all of the available documentation relevant to the pre-leasing process. In other cases, the public must pay to have documents copied, or file Freedom of Information requests in order to obtain copies.

Assessment of impacts is issue driven in that unless potentially affected members of the public are tenacious, even through the stages of developing lease stipulations and other mitigation measures, there is virtually no way to assure that their concerns will be identified or addressed during pre-lease planning. For example, some contend that Unsuitability Criterion #17 (municipal watersheds) is only applied if potentially affected municipalities raise concerns. Differences in tract rankings made in Uinta Round I, as opposed to Round II, concerning leasing in the watershed of Scofield Reservoir illustrate the effect that can result from the involvement of local government entities. In this instance, tracts in close proximity to a municipal reservoir were dropped from the preferred alternative in Round II. However, this was only done after municipalities voiced concerns when tracts in even closer proximity to the reservoir were leased in Round I (10c).

The period available for **public review** of documents on which opportunities for participation are afforded may be significantly shorter than the 15-day notice period due to the time needed to obtain documents. As a result, the review period is often perceived as being too brief, which makes it difficult for reviewers, who usually have other commitments to their time, to provide comments. In some instances, residents of affected areas do not speak English. For example, in the San Juan River region, a significant number of the residents speak only Navajo. In that area, a Navajo-speaking BLM employee traveled to Chapter Houses to describe the leasing process to the residents, and all testimony at public hearings was translated directly for Navajo attendees (6). Yet, even for those who attend these meetings, cultural differences may inhibit understanding of the process and its effects on local residents. The quality of public input suffers as a consequence of these and other factors.

When given adequate opportunity, the public has many times provided information to BLM that has been useful to the planning process. Similarly, pressure from the public has led in some cases to BLM's undertaking special studies on issues of critical concern to the public, including air quality in the Fort Union region, hydrology in Green River-Hams Fork and Uinta-Southwestern Utah, and cultural resources in the San Juan region. These special studies generally have been acknowledged by BLM as improving the quality of information upon which environmental judgments are made.

An example of the importance of public involvement in BLM's baseline environmental data collection occurred in the Powder River region. A member of the public with the necessary knowledge and expertise identified one of the tracts proposed for leasing in Round II as having present within its boundaries a nesting area of a species of high interest to the State (Unsuitability Criterion #15). Provision of this information to BLM resulted in the designation of an area unsuitable for mining around the nesting area.

Conversely, material provided by the public to BLM has sometimes been ignored during decisionmaking. For example, industry and State governments provided information indicating the proposed regional leasing levels were too high in San Juan, Fort Union, and Uinta-Southwestern Utah. Only in San Juan, where the Regional Coal Team concurred, were they adjusted downward.

One category of public involvement that is in a large sense a special case is the degree to which potential lessees participate in the collection and sharing of coal resource and baseline environmental inventory data, and obtaining surface owner consent to data collection/research as well as mining. A decision by a particular coal company not to share information with BLM makes it possible for that company to delay a tract's being offered for lease (see discussion of "Data and Analysis").

ENVIRONMENTAL ISSUES OF INDIAN TRIBES

In its efforts to involve a wide range of parties in its study on the environmental compatibility of the Federal leasing program, OTA included the issues and concerns of Indian tribes whose reservations are located near Federal coal tracts. Tribal environmental issues and concerns pertain both to the programmatic aspects of the leasing program and to specific, substantive impacts that would likely result from actual development of the tracts. In those instances where tribal concerns are primarily socioeconomic, these are noted.

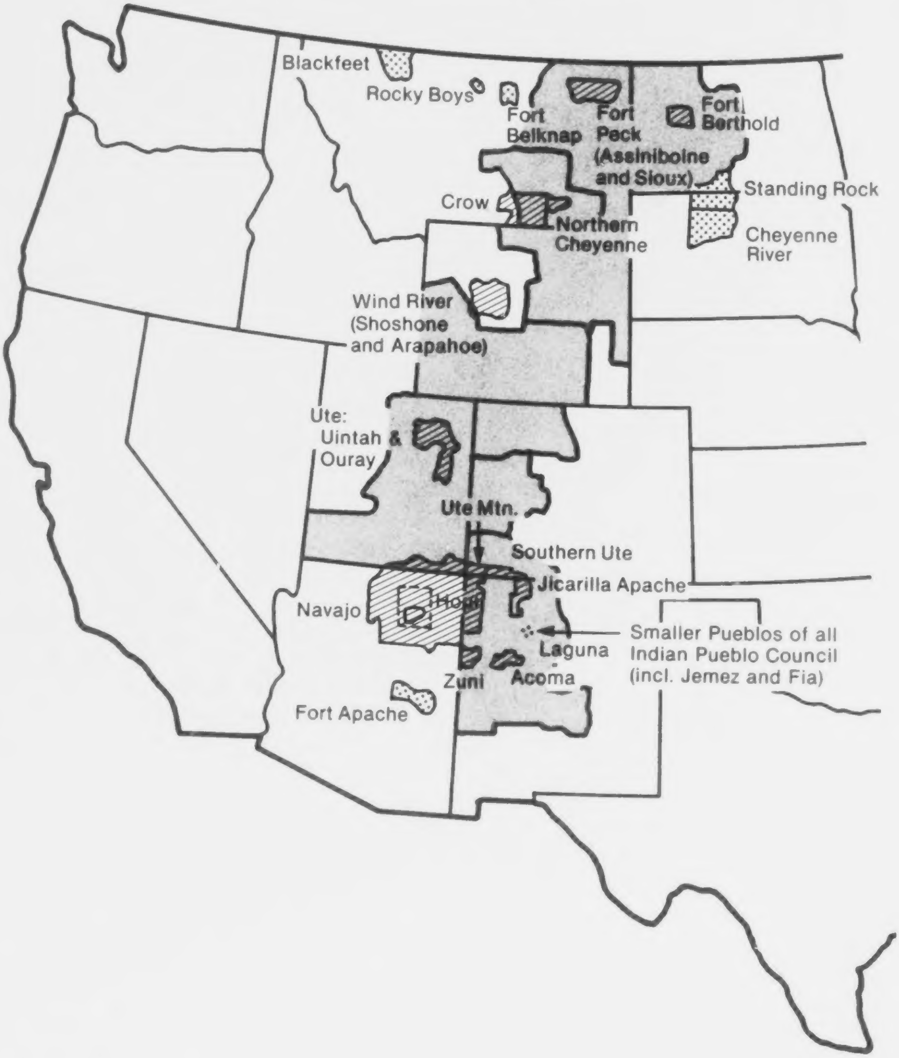
To assist in understanding more fully the nature of tribal issues, this section first describes both the geographical and administrative context of the tribes as they relate to Federal coal leasing, and then outlines both in a general and tribe-specific manner the environmental issues and impacts that will or might be expected to result from the leasing program. The potentially affected tribes are shown in figure 18.

In addition to geographic proximity to Federal coal lease tracts, Indian tribes are included in both the FCLAA and FLPMA regulations as government entities that are to be consulted throughout the course of Federal planning for both overall land use and particular activities (coal leasing). Specifically, these regulations require BLM to consult with Indian tribal governments during the development of land use plans and, during the activity planning stage, after tract selection and ranking but before adoption of specific lease sale schedules. Apart from these regulatory provisions, the Federal Government—and the Department of the Interior in particular—bears a general trust responsibility to Indian tribes.

In order to: 1) identify generic tribal environmental concerns with BLM's administration of the Federal coal leasing program, and 2) present as accurately as possible tribe-specific concerns about environmental issues and/or impacts, each of the potentially affected tribes was contacted through telephone interviews and/or personally at a Council of Energy Resource Tribes (CERT) meeting in Denver, and the following questions were posed:

- If Federal coal lease tracts have been sold or proposed for sale near your reservation, was your tribe adequately consulted during the various stages of the leasing process, especially concerning the environmental consequences of the proposed lease development?
- If a Federal coal lease tract is developed (now or in the future) near your reservation, what would you consider to be the principal environmental issues and/or impacts?
- As presently constituted, is the Federal coal leasing program adequate to ensure environmental protection **for your tribe** through the various stages of the leasing process? If not, what changes should be made and during what stage, comprehensive land use planning or activity planning?

Figure 18.—Sketch Map Showing Approximate Locations of Indian Reseverations Relative to Coal Leasing Regions


Blackfeet
Rocky Boys
Fort Belknap
Fort Peck (Assiniboine and Sioux)
Fort Berthold
Standing Rock
Crow
Northern Cheyenne
Cheyenne River
Wind River (Shoshone and Arapahoe)
Ute: Uintah & Ouray
Ute Mtn.
Southern Ute
Jicarilla Apache
Navajo
Hopi
Smaller Pueblos of all Indian Pueblo Council (incl. Jemez and Fia)
Laguna
Zuni
Acoma
Fort Apache

The information in this section is drawn primarily from tribal responses to these questions.

General Environmental Issues and Impacts

Although Indian tribes vary greatly because of political, cultural, and geographical differences, certain general conclusions still can be reached concerning their responses to the first and third questions listed above. First, even though BLM generally has consulted tribes during the leasing process, almost all tribes feel that this consultation has been inconsistent and inadequate during land use planning, and has tended more toward "notification" than "consultation" during activity planning. Similarly, the tribes do not think they have been provided with adequate information to support effective participation in decisions or recommendations on leasing levels or lease sales.

Another aspect of the consultation process is BLM's coordination through and use of the Bureau of Indian Affairs (BIA, a sister agency of BLM within DOI) to interact with the tribes. Discussions with BIA officials at the Denver regional office and at local agency offices, and the responses from the Tribes, indicate that BLM probably has not taken full advantage of this interagency relationship, either as a means of obtaining data needed to analyze potential impacts adequately or as a way to assist the tribes in evaluating coal lease tract decisions.

Second, all respondents agreed with OTA's finding that the Federal coal leasing program, as expressed in the legislation and general regulatory framework, is adequate to ensure environmental protection, but that to be effective the program must be implemented as originally intended. To accomplish this, Indian tribes—as other interest groups—must be able to participate **effectively** at key decision points.

In this context, a related issue pertains to the Regional Coal Teams (RCTs) and the participatory level to date by Indian tribes. Some tribes, including the Navajo and Northern Cheyenne, have been ex officio members on their respective RCTs, while others have had representation on a BLM District Advisory Council. The Navajo Tribe recently was recommended by the Governor of New Mexico to be a voting member of the San Juan River RCT. A tribe's involvement with the Federal coal leasing program will and should vary greatly depending on proximity to potential lease tracts and to subsequent impacts caused by expected development. Accordingly, it may be useful to distinguish a tribe's role on the RCT by the same basis—tract proximity to a reservation and magnitude of probable environmental and socioeconomic impacts.

A final general concern of all tribes is the disparity between the tribes and State and off-reservation local governments in the availability of funds to mitigate the adverse impacts of coal development. Tribes generally do not receive a share of Federal bonuses, rentals or royalties; cannot collect severance, gross proceeds, or any other taxes from mines not located on reservation lands; and have virtually no independent tax base of their own on which to draw.

Tribe-Specific Environmental Issues/Impacts

The following summaries present the key concerns of potentially affected tribes **as expressed to OTA;** independent evaluation of these concerns was beyond the scope of this report. The environmental and other impacts listed reflect each tribe's own priorities, unless otherwise indicated.

Fort Union Coal Region

THREE AFFILIATED TRIBES (FORT BERTHOLD RESERVATION)

Federal coal lease sales have been held recently in areas near Fort Berthold, the most recent being the September 1983 Fort Union sale.

Consultation: The tribes were directly consulted by BLM concerning both the environmental consequences of leasing and the subsequent lease development.

Environmental Issues/Impacts:

1. *Air Quality.* Concerns include increases in TSP, SO_2, NO_x, and visibility reduction. An indirect economic impact may result from the reservation's location near Theodore Roosevelt National Park, which has a Class 1 air quality designation; as nearby Federal coal lease tracts are developed, air quality increments could be used up and the likelihood that tribal coal can be developed in an environmentally compatible manner would be reduced.

2. *Water Rights* (water quantity or supply). Not only is coal development often water intensive, but the State manages the water use permitting process.

FORT PECK ASSINIBOINE AND SIOUX TRIBES

Fort Peck Reservation is located approximately 30 to 50 miles north of proposed Federal coal lease tracts in the Montana portion of Fort Union.

Consultation: The tribes do not feel they were consulted adequately prior to the draft EIS; the draft EIS in July 1982 was perceived by the Tribes as their first formal notification, and they were consulted again in March 1983 regarding the proposed leasing decisions on tracts to be offered later that summer. Most importantly, the tribes commented that not enough information was provided to allow them to estimate the environmental effects of the proposed leasing alternatives, and that which was disclosed warranted only minimal additional coal leasing.

Environmental Issues/Impacts:

1. *Air Quality.* Air pollution from lease development could degrade reservation air quality, in some instances exceeding the Class 1 increments (Fort Peck Reservation has been designated a Class 1 air region under the Clean Air Act).

2. *Wildlife.* Migratory wildlife on the reservation may suffer as a result of habitat degradation south of the reservation.

3. *Socioeconomic.* The large influx of workers would strain available resources, at the expense of tribal and other local residents.

Powder River Coal Region

NORTHERN CHEYENNE TRIBE

In the view of the tribe, location of the reservation in the virtual center of the Powder River coal tracts, as well as the magnitude of surrounding coal mines/conversion facilities (existing and proposed), has and will likely continue to create significant adverse environmental and socioeconomic impacts. This situation, and the specific factors listed below, place the tribe in a nearly unique situation vis-a-vis the Federal coal leasing program.

- major north-south and east-west highway corridors (for both commuter and service traffic to/from mining and conversion facilities) bisect the reservation;
- rail lines for coal transport are proposed along Tongue River on eastern reservation boundary;
- reservation designated as Class 1 Air Quality Region in 1975, prior to current Federal coal leasing program;
- the tribe has its own significant coal resources, but has chosen to delay development because of lack of tribal control over development; and
- finally, unlike some reservations, Northern Cheyenne's is indeed "home" to its members (85 percent of on-reservation population is Northern Cheyenne, and 99 percent of surface used by tribal members).

Accordingly, the tribe contends that the impacts from the increased population associated with intensive coal development will continue to add significant environmental and socioeconomic impacts on already stressed tribal public facilities, services, and environs. The Northern Cheyenne do not feel that, historically, they have had an equal opportunity to participate in off-reservation workforce and commercial ventures, nor does the tribe share the substantial and other tax revenues that will be available to State and local governments to mitigate impacts of coal development.

Consultation: The Northern Cheyennes are not categorically opposed to Federal coal development surrounding their reservation. Rather, the tribe's principal concern is that, as required by law, the development be undertaken with a sensitivity to the social, economic, and environmental impacts on **all** local communities, including the Northern Cheyenne. As presently formulated, Federal coal leasing portends uniformly negative consequences for the Northern Cheyenne Tribe in their view. Further, the tribe has found BLM's consultation effort, its analysis of impacts during activity planning, and its consideration of mitigation measures (e.g., lease stipulations) to be inadequate. A prime example cited by the tribe is the EIS prepared for the 1982 Powder River sale, which gave little or no recognition to the combined environmental/socioeconomic impacts noted in this section. When BLM refused to consider any modifications in the 1982 sale, despite a substantial tribal effort to demonstrate the defects in its formulation, the tribe filed *Northern Cheyenne* v. *Watt,* which is currently pending (16).

Additionally, although an ex-officio member of the Powder River RCT, the tribe noted that it has limited resources to participate meaningfully and perform adequate analyses of lease sale proposals. For the Powder River Round 2 sale, the tribe has increased its own participation substantially, including the formulation of lease stipulations to mitigate adverse impacts and ensure that the tribe benefits from the positive effects of the surrounding coal development. Finally, the tribe contends that BLM-BIA coordination has been largely a token relationship, not taking full advantage of the BIA's trust relationship with the tribe.

Environmental Issues/Impacts:*

1. *Socioeconomic.* Because of the tribe's particularly vulnerable economic situation and proximity of the reservation to the lease tracts, socioeconomic impacts are the most serious concern of the tribe; public services/facilities most likely to be heavily affected are roads, recreation facilities, traffic control, law and order, health care, and housing. At the same time, absent special measures, the Northern Cheyennes will not share in the substantial revenues available to off-reservation governments to mitigate adverse impacts (e.g., royalties, severance taxes), and may not have an opportunity to participate in the economic benefits of surrounding development. For example, absent a binding obligation to employ Northern Cheyennes (e.g., via lease stipulations), off-reservation coal operators have not made a special effort to do so. At Colstrip, 10 miles north of the reservation, Montana Power Co.'s generating plants are subject to a binding employment preference which has gained a significant number of jobs for tribal members. But at the adjacent Colstrip mine, where there is no such preference, the Northern Cheyenne feel they have been given only minimal consideration in the filling of over 500 jobs.

2. *Air Quality.* Given the reservation's Class 1 designation, the tribe is concerned with fugitive dust from mining activities and other impacts from conversion facilities; it also considers the current BLM air quality analysis for the Powder River Round II sale to be inadequate, not accounting for cumulative air quality impacts in establishing the EIS baseline. Finally, the tribe is concerned that air quality increments in the region are being usurped from the tribe's own use.

3. *Water Quality.* Aquifer interception and contamination from mining activities could affect tribal water supply (largely wells). Surface water pollution of the Tongue River is another concern.

4. *Wildlife.* Migration routes of wildlife moving onto reservation are being disrupted, affecting tribal residents' food supply (60 percent of the tribe supplements their food from this source).

5. *Historic and Burial Sites.* Many are located off-reservation, and could be disrupted or destroyed.

CROW TRIBE

Both the northeastern and southeastern boundaries of the Crow Reservation are located near Federal coal lease tracts (Colstrip, Spring Creek, and North/West Decker) and existing coal mines and conversion facilities. In addition, an active coal mine is located in a ceded area at the northeastern border of the Reservation, and another mine in the southeastern portion of the Reservation, Youngs Creek, is slated to begin operation in 1986.

Consultation: The tribe has expressed concerns on two counts with respect to BLM consultation: 1) lack of tribal involvement in the development of the land use plans and specific lease sale schedules, and 2) failure to factor the tribe's coal reserves into the regional baseline and follow-on analyses for both environmental and socioeconomic impacts on the tribe. Also, the tribe noted a virtual lack of any mention and/or analysis of environmental impacts on the Crow Reservation in the Powder River Round I lease sale EIS.

Environmental Issues/Impacts:

1. *Air Quality.* Pollution could be significant, especially if second- and third-level mining development scenarios (large-scale strip mining of coal and related conversion facilities—powerplants and synthetic fuels) occur in the region.

2. *Water Quality/Quantity.* The major concern is pollution of tributary streams on or adjacent to the reservation.

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*Not prioritized by the tribe.

3. *Socioeconomic.* A mass influx of workers/families from intensive regional coal development would result in an overall degradation of quality of life and place additional stress on already strained public facilities/services and infrastructure.

Green River-Hams Fork Region

THE WIND RIVER TRIBES (SHOSHONE AND ARAPAHOE)

Currently not involved and/or near any Federal coal lease tracts; they may also more properly be placed in Powder River Region, but their status or level of involvement would not change.

Uinta-Southwestern Utah Coal Region

UTE INDIAN TRIBE (UINTAH AND OURAY RESERVATION)

The southern boundary of the Uintah and Ouray Reservation is approximately 25 miles north of the northernmost Federal coal lease tracts in this region. These are underground mine tracts with limited development, and are separated from the reservation by a major canyon. Although it is not clear that the tribe would sustain any serious environmental impacts from development of these tracts (because of the topographic and other physiographic characteristics), the tribe nonetheless felt it should have been consulted.

Consultation: The tribe was never contacted during the leasing process. According to BLM, this was because the nearest tracts are limited development, and because wildlife mitigation routes, hydrologic drainage, job availability, etc., historically have not crossed the canyon in between.

Environmental Issues/Impacts: Air quality, water quality/quantity, wildlife, and socioeconomic impacts were listed as the tribe's priorities.

San Juan River Coal Region*

As noted elsewhere in this report, a myriad of circumstances and Federal land management decisions have affected the environmental compatibility of coal leasing in the San Juan region, not the least of which concern Indian tribes. For example, the Navajo-Hopi relocation effort, the litigation by Navajo allottees regarding surface owner consent and coal ownership, tribal cultural concerns, and PRLA disposition have had a direct bearing on the current status of the San Juan leasing program and corresponding environmental impact assessments.

Moreover, as with tribes elsewhere, environmental impacts and socioeconomic disruption will heavily affect the San Juan Region tribes if the leasing program is not more sensitive to tribal concerns. Even though economic considerations of coal leasing and development are a mixed blessing: some tribal members will feel new jobs are a benefit; others will feel that the costs of relocation, destruction of sacred sites, loss of grazing lands, adverse air and water quality impacts, and loss of ambience (solitude, intrusion by outsiders, etc.) will outweigh any economic return. These and other particular environmental concerns of individual tribes in the San Juan Basin are presented below.

PUEBLO OF LAGUNA

Competitive Federal coal lease tracts (Chico Wash South, Lee Ranch East-Middle-West) are located approximately 25 to 30 miles northwest of the Reservation.

Consultation: The Pueblo does not feel it was consulted adequately in the initial phases. The Pueblo noted another concern—that they be kept informed of any agreements related to Federal coal leasing that are executed among the various Federal agencies—BLM, BIA, BOM, et al.

Environmental Issues/Impacts:

1. *Archaeological sites,* e.g., Chacoan Outliers.
2. *Groundwater*—aquifer interception and groundwater recovery.
3. *Air Quality.*

THE NAVAJO TRIBE

The tribe is heavily involved in the San Juan coal leasing program in a number of ways:

- proximity to several competitive coal lease tracts;

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*Note: In the San Juan region, only the Navajo Tribe and the Pueblos of Laguna and Acoma responded to OTA's questionnaire.

- the large quantities of coal underlying tribal lands;
- the Navajo-Hopi relocation effort, which also encompasses the Paragon Ranch issue;
- the disposition and legal validity of PRLAs;
- water rights and appropriation levels for the basin; and
- surface ownership by Navajo Tribal members where some of the leasing activities will occur.

These and other issues point up the integral role that the Navajo Tribe should play in the implementation of the Federal coal leasing program in the San Juan Basin. Many of the areas to be leased are occupied and used by tribal members, and they have several legal claims pending to much of the coal and surface involved.

Consultation: Tribal concerns here center around: 1) inadequate consultation during land use planning, and more importantly, 2) the lack of time and relevant information during activity planning to participate effectively on issues confronting the tribe. Regarding the latter, the most recent example pertains to the perceived inadequacy of the public hearing process—timing and location(s)—for the second San Juan draft EIS (BLM held the hearing in Farmington, N. Mex., the closest town to the Navajo residents that would be affected most by leasing). The tribe told BLM that the proposed hearing process would most certainly preclude Navajo concerns from being heard and addressed. Finally, regarding participation in the San Juan RCT, the Navajo Tribe currently is an ex officio member, and recently was recommended by the Governor of New Mexico to be a full, voting member in recognition of the tribe's unique role and situation in the Basin. However, the Director of the BLM has rejected this recommendation.

Environmental Issues/Impacts*:

1. *Socioeconomic.* These impacts are of utmost concern to the tribe: the relocation plan for Navajo families affected by PRLAs is inadequate and/or unacceptable in terms of compensation, cultural implications, replacement of grazing lands, destruction of sacred sites, overall ambience, and relocation of graves; the economic benefits of added coal development probably will not accrue to the Navajo people; and the impacts from an influx of people will result in housing shortages, increases in crime and alcoholism, and a deterioration in law and order. All of these in turn will adversely affect the Navajo lifestyle.

2. *Reclamation and Revegetation.* The tribe finds the second draft EIS still inadequate on this issue; loss of grazing land from proposed mining activities is not estimated, nor do they feel the issues surrounding reclaimability were addressed adequately, such as a specific, comprehensive reclamation plan, treatment of toxic material, top soil preservation, and irrigation needs.

3. *Water Quality and Quantity.* Tribal concerns center around the availability of the estimated 52,000 acre-feet annual water requirement for the proposed mining and related conversion facilities on lease tracts (notwithstanding the current scarcity for existing domestic, irrigation, and livestock demands), and the possibility of a new town in the region. Other water quality impacts include groundwater interception and/or the recharge levels of aquifers currently supplying water to many tribal lands. Finally, the tribe is concerned that water quality may be impaired because of the increased coal development activities nearby.

4. *Cultural, Archaeological, and Paleontological Resources.* The Navajo Nation strongly believes that comprehensive inventories of these resources must be undertaken before decisions are made to implement the leasing plan. Otherwise, Navajo graves and sacred sites, and the rich diversity of significant archaeological and paleontological resources in the region will be irretrievably lost, not only to the tribe but also to society in general. The tribe points out further that the second draft EIS does not address relocation/restoration of sacred areas and gravesites, and contends that it does not include adequate salvage, recovery, and preservation plans for the archaeological and paleontological resources.

5. *Air Quality.* The tribe feels that several aspects of adverse impacts on regional air quality—fugitive dust, smog, sulphur dioxide, nitrogen oxides, etc.—have not been adequately analyzed

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*Not prioritized by the tribe.

in the leasing process. Moreover, in the second draft EIS, **cumulative** air quality impacts have not been properly considered, whether from existing mining activities, existing and proposed railroads, oil and gas fields, or other powerplants/projects in the basin. Finally, specific mitigation measures for air pollution are not fully addressed in the draft EIS or other leasing documents, according to the Navajos.

6. *Noise and Vibration.* The tribe does not think that adverse impacts on people, livestock, and wildlife from both noise and vibration, as well as damage to fragile archaeological/paleontological resources from blasting, have been quantified adequately. Furthermore, in their view, mitigation measures, such as lease stipulations, have not been developed satisfactorily to either eliminate or minimize these problems.

7. *Fish and Wildlife.* According to the tribe, the information provided to date in draft EISs and other BLM documents does not adequately describe the baseline, especially threatened and/or endangered species that could be affected by the proposed leasing actions. The tribe suggests that mitigation measures also should be included.

8. *Visual.* The visual quality of the region could be degraded by increased urbanization in existing communities, mining operations and surface conversion facilities, improved or extended access roads, and various rights-of-way. The tribe's key concerns include the scenic quality of the landscape and possible destruction of some unique geological formations and wilderness areas.

PUEBLO OF ACOMA

Several competitive Federal coal lease tracts—including Lee Ranch East, Middle, West and Divide—are located approximately 30 to 50 miles north of the Acoma Pueblo.

Consultation: The Pueblo has indicated that they were not consulted about the leasing process. (According to BLM, this is due to the Pueblo's distance from potential lease areas and intervening topographic features.)

Environmental Issues/Impacts: Water availability is the chief concern of the Pueblo; another is the need for an adequate reclamation program.

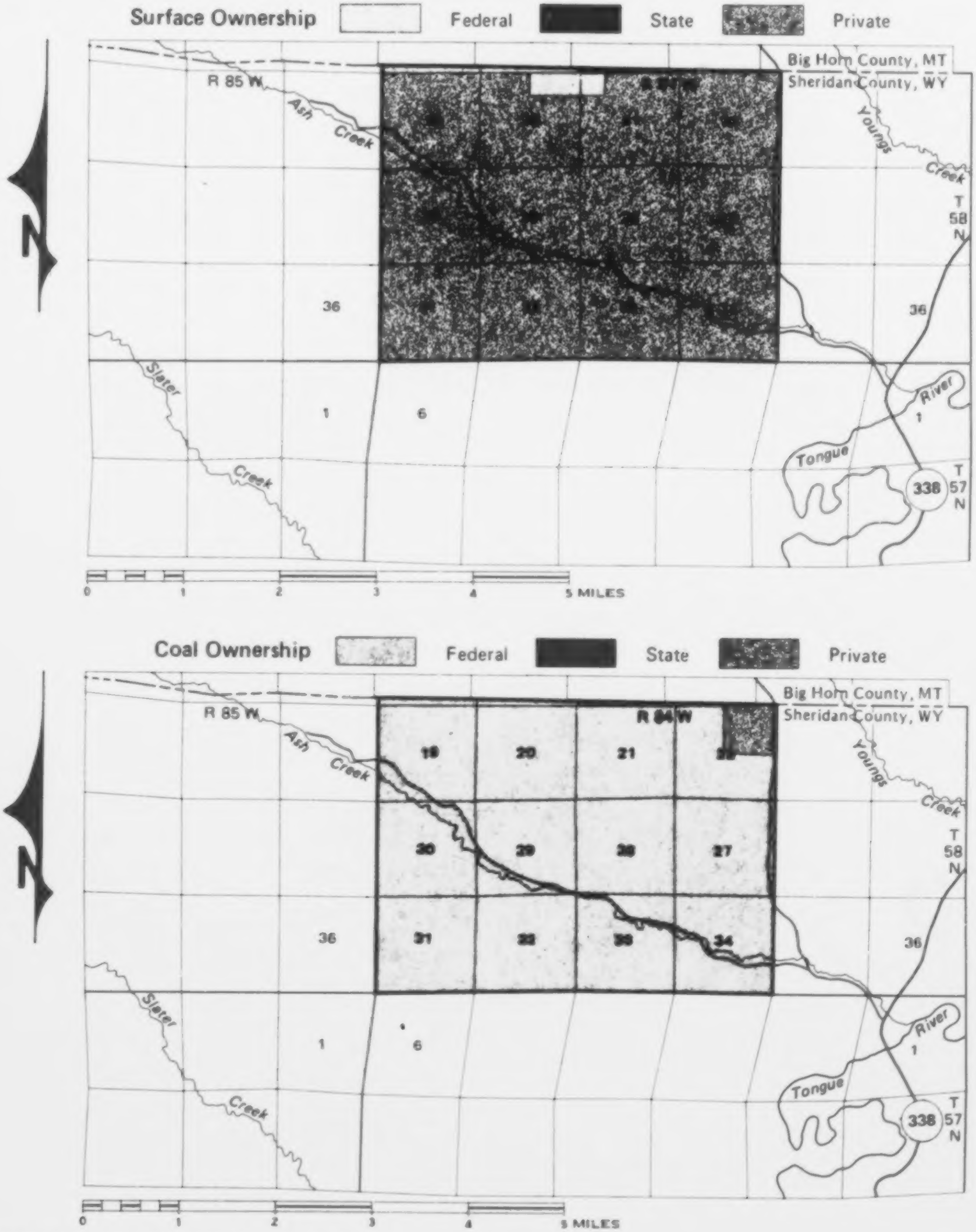
LEASING ON SPLIT ESTATE AND CHECKERBOARD LANDS

Under the original homestead laws, ranchers and farmers were granted both the surface and mineral rights to their lands. After significant homesteading had occurred in North Dakota and Montana, laws were changed around the turn of the century to allow the Federal Government to retain the mineral estate, and subsequent homesteaders only acquired the surface estate, which resulted in what is known as "split estate" ownership (see fig. 19).

Similarly, the original railroad land grants in these areas led to a "checkerboard" pattern of ownership, with alternate sections of land (640 acres) owned by the Federal government and railroad companies respectively (see fig. 20). In some cases (primarily Fort Union) the checkerboard ownership pattern only exists subsurface, and that pattern and split estates may both affect leasing situations. Checkerboard ownership is most prevalent in the Fort Union Coal Region, the northern portion of the Powder River region, and the Wyoming portion of Green River-Hams Fork. Split estate lands also exist in the San'Juan River region, in which a significant fraction of the Federal coal underlies Indian surface. Surface owners include individual tribal members, BIA, or the Navajo Nation. Finally, as noted earlier in this chapter, conflicts over land use planning, impact significance, and leasing decisions have arisen where Federal coal underlies lands managed by the Forest Service (and other Federal surface management agencies), although this is not legally a split estate situation.

The extent of split estate lands in Western coal regions is illustrated by the fact that there are 9.7 million acres of recoverable Federal coal reserves

Figure 19.—Example of Split Estate with Predominantly Private Surface and Federal Coal
(Ash Creek tract, Western Powder River area)


Surface Ownership
Federal
State
Private
R 85 W
Ash Creek
Big Horn County, MT
Sheridan County, WY
Youngs Creek
T 58 N
36
36
Slater Creek
1
6
Tongue River
1
338
T 57 N
0
1
2
3
4
5 MILES
Coal Ownership
Federal
State
Private
R 85 W
R 84 W
Ash Creek
Big Horn County, MT
Sheridan County, WY
Youngs Creek
19
20
21
22
30
29
28
27
T 58 N
36
31
32
33
34
36
Slater Creek
1
6
Tongue River
1
338
T 57 N
0
1
2
3
4
5 MILES

SOURCE: Bureau of Land Management, *Powder River coal tract summaries* (April 1983).

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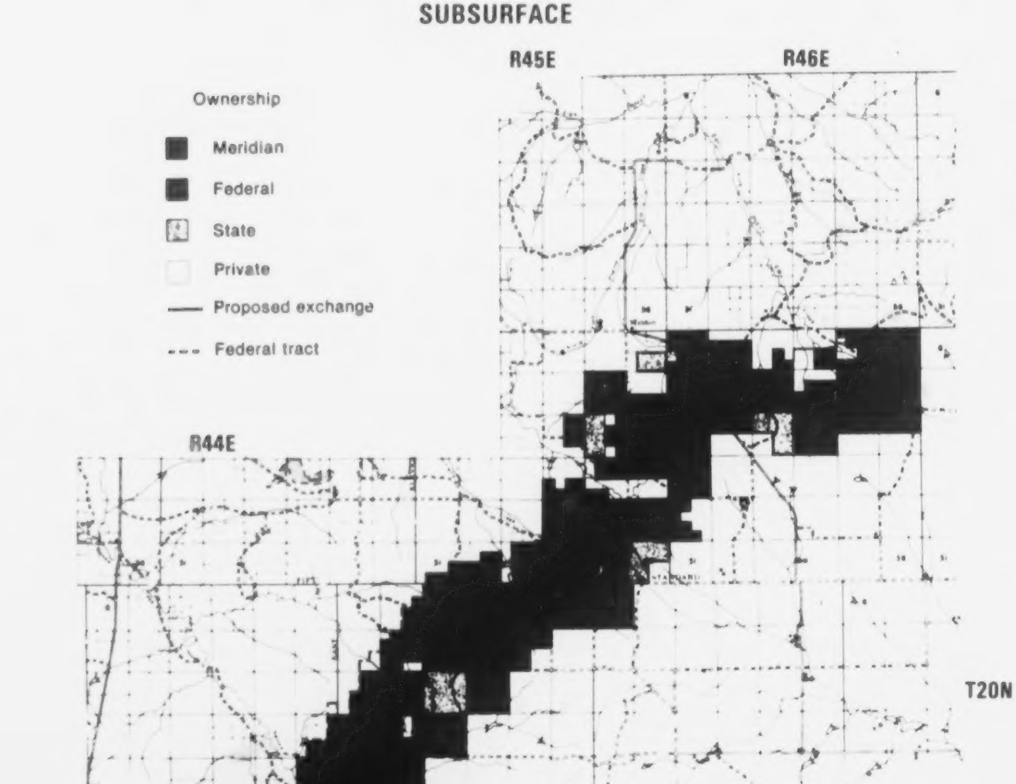
Figure 20.—Example of Checkerboard Ownership Pattern of Coal Resources
(Meridian tract, Fort Union region)


SUBSURFACE
Ownership
Meridian
Federal
State
Private
Proposed exchange
Federal tract
R45E
R46E
R44E
T20N
T19N
T18N
0 1 2 3 4 5 6
Scale in Miles
N

SOURCE: Bureau of Land Management, *Fort Union Coal Region Draft Environmental Impact Statement* (July 1982).

in the six principal Western coal States, of which 6 million acres underlie private surface. However, the geographic distribution of split estates varies widely. At one end of the spectrum, in the North Dakota portion of the Fort Union Coal Region, virtually all (99.5 percent) of the federally owned coal is overlain by non-Federal surface, while in the Montana portion, over 90 percent of the Federal coal is beneath non-Federal surface (8b). At the other end of the spectrum, the Uinta-Southwestern Utah, much less (20 percent) of the federally owned coal underlies non-Federal surface (see table 15).

These ownership patterns can affect the development potential of both Federal and non-Federal coal resources. For example, due to the need to form logical mining units and avoid bypass situations, BLM estimates that 42 percent of the total coal reserves in Fort Union could not be developed without the leasing of Federal coal because of the combination of checkerboard ownership and split estate (8b). The proportion of total resources dependent on the leasing of Federal coal in Powder River and Green River-Hams Fork is 16 and 27 percent respectively (2; 4a; 4b).

A major concern with planning and environmental assessment in the coal leasing program is the difficulty in implementing the program in areas of predominant split estate and/or checkerboard ownership, compared to those areas with significant Federal surface ownership. The statutes and regulations defining the program provide limited guidance for implementation in geographic areas sensitive to the type and extent of Federal ownership. An abbreviated planning process, called the land use analysis, is suggested for split estate leasing, but in practice land use analyses are indistinguishable from updated or amended MFPs. These and other uncertainties about how to implement the program on split estate lands results in a lack of definition as to the authority carried by land use plans, lease stipulations and other mitigation requirements, and enforcement of the mining and reclamation plan on those lands.

Split estate lands pose substantial land management problems for BLM, yet resolving these problems ranks low in the competition for agency funds and manpower compared to surface ownership management responsibilities. Data collection on private surface typically is not pursued aggressively by BLM. In some instances, data have been withheld by surface owners (or BLM has been denied access to the surface to collect data), either to facilitate leasing by avoiding the discovery of problems, or to force a tract to be dropped from the lease process due to lack of data. In other cases, leasing on split estate lands has been foreclosed because insufficient time was available during pre-lease planning to obtain the numerous surface owner consents needed in these areas.

On the other hand, data collection and analysis have been more extensive where the Secretary has a continuing responsibility with respect to the private surface estate. This is the case with Indian lands (lands held in trust) outside the boundaries of the reservations (e.g., the BLM/BIA interagency agreement concerning lands in the San Juan region).

Data collection actually can be facilitated on checkerboard lands. If the railroad company has undertaken inventories on its land, those data will help BLM narrow the issues and focus their land use planning. However, if the company data are not shared with BLM, the same planning problems can arise with checkerboard lands as with split estate (see discussion of Burns Creek tract in section on "Data and Analysis").

There is substantial concern within BLM regarding land use planning on private surface when the only Federal interest is the mineral estate, or when the Federal surface is intermingled with private surface. The concern focuses in part on whether or not the authority exists for BLM to enforce mitigation measures on private surface lands, not only during mining and reclamation, but also after reclamation in terms of being assured that the approved post-mining land use will be maintained following release of the reclamation bond. If it is found that such authority does not exist, the flexibility to choose between mitigating impacts versus declaring areas unsuitable for mining is constrained substantially.

Post-mining land uses on split estate lands are of particular concern where those lands remain

Table 15.—Ownership of Surface and Coal Resources in Five Western Coal Management Regions[a] (in acres)

Region	Federal surface/ Federal coal[b]	Percent of total	Federal surface/ non-Federal coal[b]	Percent of total	USFS surface/ Federal coal	Percent of total	USFS surface/ non-Federal coal	Percent of total	State surface/ Federal coal	Percent of total
Fort Union:	31,680	1.0%	2,260	—	2,890	—	0	—	14,320	—
North Dakota	800	—[d]	0	—	2,890	—	0	—	3,640	—
Montana	30,880	2.5%	2,260	—	0	—	0	—	10,680	1.0%
Power River:	584,331	9.5%	1,891	—	490,501	7.9%	8,160	—	45,608	1.0%
Montana	193,430	10.3%	60	—	434,515	23.1%	3,120	—	21,190	1.1%
Wyoming	390,901	9.8%	1,831	—	55,986	1.4%	5,040	—	24,418	1.0%
Green River-Hams Fork:	1,179,740	43.9%	4,840	—	2,220	—	640	—	6,012	—
Wyoming	1,124,370	51.8%	960	—	160	—	0	—	2,732	—
Colorado	55,370	10.8%	3,880	1.0%	2,060	—	640	—	3,280	1.0%
Uinta-Southwestern Utah:	765,630	45.5%	6,640	—	384,270	22.9%	1,040	—	4,680	—
Colorado	230,730	40.8%	2,680	—	94,980	16.8%	0	—	0	—
Utah	534,900	47.9%	3,960	—	289,290	25.9%	1,040	—	4,680	—
San Juan River:	1,219,770	48.4%	27,040	1.1%	62,650	2.5%	3,140	—	27,190	1.1%
Colorado	34,470	12.6%	120	—	55,620	20.3%	3,140	—	2,910	1.1%
New Mexico	1,185,300	52.8%	26,920	1.2%	7,040	—	0	—	24,280	1.1%

Table 15.—Ownership of Surface and Coal Resources in Five Western Coal Management Regions[a] (in acres) (continued)

Region	State surface/ non-Federal coal	Percent of total	Private surface/ Federal coal	Percent of total	Private surface/ non-Federal coal	Percent of total	Other surface/ Federal coal[c]	Percent of total	Other surface/[c] non-Federal coal	Percent of total	Total coal resource
Fort Union:	111,080	3.0%	1,205,740	32.2%	2,263,470	60.4%	91,580	2.4%	27,450	1.0%	3,750,470
North Dakota	44,600	1.8%	711,160	28.3%	1,643,250	65.4%	79,860	3.2%	26,170	1.0%	2,512,370
Montana	66,480	5.4%	494,580	40.0%	620,220	50.1%	11,720	1.0%	1,280	—	1,238,100
Powder River:	473,099	7.7%	3,814,722	61.7%	720,166	11.6%	70,837	1.2%	32,203	—	6,185,532
Montana	107,980	5.8%	1,046,895	55.8%	443,560	23.6%	2,470	—	2,960	—	1,877,651
Wyoming	365,119	9.2%	2,767,827	69.5%	276,606	6.9%	68,367	1.7%	29,243	—	3,985,338
Green River-Hams Fork:	102,764	3.8%	330,575	12.3%	1,029,655	38.3%	29,648	1.1%	160	—	2,686,254
Wyoming	57,134	2.6%	56,235	2.6%	912,860	42.0%	17,883	1.0%	40	—	2,172,374
Colorado	45,630	8.9%	274,340	53.3%	116,795	22.7%	11,765	2.3%	120	—	513,880
Uinta-Southwestern Utah:	74,590	4.4%	285,410	17.0%	143,290	8.5%	15,320	1.0%	400	—	1,681,270
Colorado	8,190	1.5%	180,070	31.9%	44,360	7.9%	4,160	1.0%	0	—	565,170
Utah	66,400	6.0%	105,340	9.4%	98,930	8.9%	11,160	1.0%	400	—	1,116,100
San Juan River:	160,620	6.4%	273,570	10.9%	183,220	7.3%	430,080	17.1%	133,500	5.3%	2,520,780
Colorado	22,220	8.1%	68,950	25.2%	84,840	31.0%	680	—	1,120	—	274,060
New Mexico	138,400	6.2%	204,620	9.1%	98,380	4.4%	429,400	19.1%	132,380	5.9%	2,246,720

[a] Includes Known Recoverable Coal Resource Areas (KRCRAs) defined as of March 1978.
[b] Includes BLM-administered and other public domain lands, excluding National Forest lands.
[c] Includes Bankhead-Jones acquired lands, Federal withdrawn lands (e.g., military reservations), and Indian lands.
[d] "—" indicates less than 1 percent.

SOURCE: Bureau of Land Management, *Final Environmental Statement Federal Coal Management Program*, 1979.

undeveloped. For example, in North Dakota, a high proportion of the split estates contain woodland (woody draws) and wetland habitats essential to wildlife (including native prairie lands). These areas generally were the last homesteaded due to their low agricultural potential. Wildlife biologists have expressed concern that mining on such lands will relieve the pressure, after bond release, to maintain the lands in their natural state or, alternatively, that they will be more suitable for agricultural development after mining (9). The potential for changes in post-mining land use is high enough that it has led coal companies to question the rationale for rigid reclamation standards on split estate lands. In addition, Federal agency personnel and environmental groups that fought for high reclamation standards also have expressed concern over the possibility that mining these lands could speed up the process of wildlife habitat destruction unless there is some guarantee that they will be returned to pre-mining land uses.

Furthermore, the current practice in areas where split estate ownership predominates (e.g., North Dakota) is for the coal company to purchase all of the surface that will be affected by mining, and then sell it in one block after bond release. As a result, leasing in split estate and checkerboard areas is more likely to be noncompetitive. Moreover, this lack of continuity in surface ownership adds to the potential for changes in post-mining land use. It also means that the company involved is more likely to be concerned about the leasing of that area than about regional leasing levels in general.

BLM's concerns are compounded by the basic lack of understanding about split estate leasing by the public and interest groups, who expect the Federal land management process to be implemented in a uniform manner for all Federal coal. In many split estate situations, however, land use, unsuitability, and mitigation decisions typically are deferred to the State permitting authority. While such deferrals may be necessary to obtain data of "mine plan detail" to make a final decision, or to reflect the role of States and local governments in land use decisions, they tend to exacerbate the uncertainty concerning the eventual effectiveness or adequacy of the coal leasing program on split estate and checkerboard lands.

An additional problem arises because the Federal coal management program does not provide for surface landowners to be represented in the process once they have given consent to mining, unless their contracts with the lessee so specify. This lack of representation may extend through the activity planning process into mining and reclamation, and contributes to the uncertainty about reclamation standards for post-mining land uses on split estate and checkerboard lands.

The split estate situation also lends itself more to the application of multiple-use tradeoffs to resolve environmental problems rather than the unsuitability criteria. For instance, for criterion #17 (watersheds) to apply, Federal lands must be committed by the surface management agency to use as municipal watersheds. Where the Federal Government does not own the surface, this criterion cannot be used to protect watersheds. However, BLM has discretionary authority to exclude watersheds from leasing or impose mitigation measures under the multiple-use screen. Watersheds for community water supplies in both Utah and North Dakota were protected through the multiple-use screen rather than through unsuitability criterion #17 due to split estate ownership (10c; 8b). While this provides flexibility for BLM in dealing with such situations, it also tends to create uncertainty about BLM's ability to protect watersheds and other resource values on split estate lands.

Options for resolving the uncertainties about planning and environmental assessment in support of coal leasing on split estate and checkerboard lands include redefinition and the establishment of procedures for land use analyses, and the preparation of joint Federal-State Resource Management Plans (RMPs) in order to better assure full evaluation of resource tradeoffs on non-Federal lands. These options are discussed in chapter 2.

COAL EXCHANGES

The Department of the Interior's coal management regulations allow the Secretary to pursue coal lease exchanges when "coal exploration, development and mining operations would not be in the public interest on an existing lease or preference right lease application or portion thereof" (43 C.F.R. 3435.1). The purpose of these regulations is "to shift the impact of mineral operations from leased lands or portions of leased lands to currently unleased lands to preserve public resource or social values" (43 C.F.R. 3435.0-1).

In addition to resolving environmental problems on leases and PRLAs, coal exchanges might be pursued when the economic value of unleased Federal coal can be used to acquire and protect other resources on privately owned lands (e.g., to add them to National Parks or wilderness areas), or to improve management of Federal lands.

Three aspects of exchanges are especially important. First, the regulations authorize exchanges but do not obligate the Secretary to enter into an exchange; a decision to pursue an exchange is discretionary. Second, **the regulations do not permit a direct exchange of one coal lease for another;** such exchanges currently require congressional authorization on a case-by-case basis. Third, all exchanges must be for equal value. Although determination of value is a key aspect of coal exchanges, the regulations do not clearly define the procedures for the value determination.

Most of the Federal coal leases and PRLAs currently being considered for exchange were acquired by companies in what may be considered a different era. When the basic rights were granted, neither BLM nor the companies were required to address environmental issues in as comprehensive a manner as they are today. Public involvement in leasing was low, and the major concern was to locate minable coal deposits. In the transition to the current regulatory climate, companies which had showed economic foresight in acquiring Western coal reserves suddenly found that some of those reserves had become too expensive to develop, or even unminable, due to the environmental protection laws and regulations enacted in the last 15 years.

Exchanges that give a company a minable tract equivalent in value to the original lease would recognize these changes in environmental laws and regulations, and relieve the company of the economic responsibility for not foreseeing the current environmental risks. Alternatively, environmental problems that prevent mining could be treated as a normal business risk, and exchanges not allowed unless required to compensate for a "taking" under the Constitution. As a third alternative, environmental problems that prevent mining could be examined systematically to decide how to distribute the risks equitably between the public, which owns the coal resources, and the company holding the right to attempt development of that coal.

While exchanges can promote environmental compatibility, they also have economic costs. Placing lands off limits to mining deprives State and Federal Governments of potential economic benefits including jobs, severance taxes, and royalties. These benefits could be viewed as being shifted to other lands, or even postponed to the future if mining and reclamation technology advances or energy needs change and mining proceeds on previously protected lands. However, exchanges that allow companies "liberal" economic terms today may create pressure for the availability of exchanges to be expanded. This could have important implications economically and environmentally, and any such expansion should be undertaken cautiously and with full opportunities for effective public participation.

Exchanges also can have significant economic effects on the participants. A decision by the Federal Government to seek an exchange instead of finding land to be unsuitable for mining or imposing strict mitigation requirements could save the lessee or coal owner millions of dollars and increase coal management revenues to the Federal Government, but, as noted below, could decrease revenues to the States. Whether BLM continues to use the normal leasing process to foreclose mining on environmentally sensitive lands, or develops and implements an exchange program authorized by Congress, the approach chosen should be applied in a consistent and predictable manner.

Exchanges of coal lands are a relatively new issue. In spite of their newness, the total number of exchange opportunities could be quite large, and the complex environmental and economic issues they pose, and the time needed for careful evaluation of the case-by-case tradeoffs they present, could require a significant amount of BLM's resources.

Types of Exchanges

Three major types of exchanges might be considered for environmental protection of Federal lands: special statutory lease exchanges, fee exchanges, and alluvial valley floor exchanges (see table 16).

The Congress has, in several instances, authorized lease exchanges through **legislation specific to a particular lease or group of leases.** The Congress has approved lease-for-lease exchanges to protect a segment of an interstate highway underlain by Federal coal; to remove PRLAs from the Kaiparowits Plateau; to protect archaeological, paleontological and scenic values in the Bisti Wilderness Study Area in New Mexico; and to acquire non-Federal interests within the boundaries of the Rattlesnake National Recreation Area by purchase or a gift including the issuance of coal bidding rights.

Interior generally has chosen to carry out such special statutory lease exchanges using the same procedures as for regulatory exchanges (43 C.F.R. Subpart 3435). This includes requirements for public participation, land use planning, application of the unsuitability criteria, and consultation with the Regional Coal Team and with the Governor of the State in which the lands are located. Consummating a proposed exchange frequently is incorporated into the alternatives analyzed in the EIS.

Section 206 of FLPMA allows **fee exchanges,*** in which the Secretary of the Interior may dispose of a "tract of public land or interest therein" by exchange when doing so would be in the public interest. DOI holds that section 206 does not allow exchanges of coal leases but does allow Interior to swap federally owned coal for other interests in land.

In a gesture singular to the holders of coal underlying **alluvial valley floors,** SMCRA established a special exchange program for these lands. The law authorizes exchange of existing Federal coal leases for new Federal leases, as well as exchanges of fee coal (owned rather than leased) underlying AVFs for unleased Federal coal, to qualifying companies. While Interior's regulations generally assume that AVF exchanges with qualifying leaseholders would be in the public interest, all potential AVF exchanges are evaluated on a case-by-case basis.

Major Issues

Exchanges involve a new approach to resource management and many issues surrounding their ability to resolve environmental conflicts still need to be resolved. Major uncertainties include the need for more detailed guidelines and procedures for effecting exchanges, including environmental analyses, the use of bidding rights in an exchange, the entities eligible to participate in exchanges, valuation procedures, and the time and resources needed to complete an exchange.

Exchange opportunities may go unrecognized because there are few regulatory guidelines for when an exchange is appropriate. Equally important, this could mean that exchanges that are only marginally in the public interest could be undertaken. All coal development raises some environmental issues. In the current coal market, some leaseholders might find themselves holding rights that are not marketable for **economic reasons** (e.g., mining costs, access to markets, coal quality). BLM lacks adequate procedures for distinguishing exchanges that are economically motivated, but clothed in environmental concerns.

Moreover, DOI currently has no authority to **require** a lessee or fee coal holder to enter into an exchange. Given the difficulties inherent in the exchange process, this lack of authority could be a hindrance to carrying out environmental

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*A "fee" interest in land or other resources is equivalent to outright ownership.

Table 16.—Summary of Recent Exchange Proposals

Authorization and exchange	Description	Current status	Comments
1. Public Law 95-554: (Oct. 30, 1978)			
a) I-90	Lease-for-lease exchange; nine leases under I-90 and State highways in northwestern Wyoming	Completed two exchanges (one with Wyodak Coal Co., one with EXXON); proceeding with exchanges for Kerr-McGee, Belco, Gulf and Big Horn Co.	DOI is encountering problems over whether the lands the companies have selected are more suitable for competitive lease than exchange, and over low quality coal (Belco)
b) Utah P&L	Exchange of eight PRLAs owned by Utah P&L on the Kaiparowits Plateau for leases elsewhere in Utah	Dropped from further consideration in 1981 based on DOI determination that the value of the coal in the PLRAs was less than the value of the coal sought on the exchange tracts	Procedures followed by DOI in pursuing the Utah P&L exchange were criticized by the General Accounting Office
c) Lake Desmet	Mandated study of possibility of exchanging private lands near Lake Desmet Reservoir in Johnson County, Wyo., for Federal coal lands	DOI recommended against the Lake Desmet exchange in September 1979	
2. Public Law 96-475 (Oct. 19, 1980			
a) Bisti WSA	Directs DOI to issue new coal leases to the holder of two New Mexico leases affecting the Bisti Wilderness Study Area	Draft EIS issued Dec. 31, 1981; mining plan being prepared which will allow a direct comparison of values on the lands to be relinquished with the selected lands; BLM schedule shows new leases to be issued July 17, 1984	Outstanding issues include agreement on the exchange values, consultation with the Governor of New Mexico, Justice Department antitrust review, final environmental analysis. Lands selected for exchange are also included in the Bisti No. 1 competitive lease tract
3. Public Law 96-401 (Oct. 9, 1980)	Authorized DOI to negotiate for cancellation of 7 leases and 11 prospecting permits on Northern Cheyenne Reservation, and substitute Federal coal leases or bidding rights off-reservation	Cancellation agreement signed with Peabody Coal Co., Consolidation Coal Co., and Chevron Oil Co.; noncompetitive or settlement leases scheduled to be issued in 1984. Noncompetitive lease (North Duck Nest Creek) issued to AMAX Coal Co. in September 1982; remaining two cancellation agreements (Thermal Energy Inc. and Wesco Resources Inc.) signed but Northern Cheyenne did not concur	The two disputed cancellation agreements may have to be resolved through litigation
4. Public Law 96-476 (Oct. 19, 1980; as amended in Public Law 98-140; Oct. 31, 1983)			
a) Rattlesnake NRA	Established Rattlesnake National Recreation Area and Wilderness, allowing DOI to exchange private inholdings for bidding	Disputes over administration of the bidding rights resolved in 1983 amendment; bidding rights issued to Montana Power Co. on Nov. 19, 1983, will expire Nov. 1, 1995	

Table 16.—Summary of Recent Exchange Proposals (Continued)

Authorization and exchange	Description	Current status	Comments
	rights which may be exercised in a competitive coal lease sale or coal lease modification		
5. Sec. 106, FLPMA			
a) Corral Canyon	On June 24, 1983, DOI exchanged (with Rocky Mountain Energy Co.) 1,220 acres of private inholdings in Grand Teton National Park for 1,190 acres of Federal land containing 22.3 million tons of coal	Completed	Rocky Mountain Energy purchased the inholdings from various private parties for the purpose of the exchange; suit pending
b) Circle West	Economic exchange proposed by Meridian Land & Mineral Co. January 1981 on checkerboard lands in eastern Montana; deed exchanged Sept. 8, 1983; Meridian received approximately 50 million additional tons, for a total of approximately 220 million tons; agreed to pay 1 percent royalty for coal in new consolidated tract	Completed	Suit pending; recent discovery of wildlife habitat on new consolidated tract may lead to controversy
c) Lee Ranch	Economic exchange proposed by Sante Fe Railroad Co. in checkerboard lands in New Mexico	Original proposal was for 12,298 acres of coal land containing approximately 148 million tons, for 7,544 acres Federal coal (approximately 120 million tons); BLM focusing on smaller exchange alternatives. Draft land use planning amendment and environmental analysis published Nov. 28, 1983; decision on whether to proceed with exchange is pending	BLM still considering proceeding with competitive leasing of two tracts involved in the proposed exchange alternatives (Lee Ranch Middle and Lee Ranch West Tracts)
d) Teton Valley Ranch	Exchange proposed by Teton Valley Ranch, of 354 acres private land in Wyoming National Elk Refuge for 1,000 acres public coal in checkerboard area near Point of Rocks coal reserves	Scheduled for possible final decision late in 1984	Non-Federal sections of land in checkerboard owned by Rocky Mountain Energy; Teton Valley Ranch plans to lease Federal coal in the exchange to RME if the exchange is completed
6. AVF Exchanges			
a) Whitney Benefits	Proposed AVF exchange under SMCRA; involved 1,200 acres of leased private lands in the Tongue River Valley	Proceeding slowly; questions over collection of administrative costs, and extent to which private holdings qualify for AVF exchanges; drilling program is being proposed for portion of lands	Suit pending

SOURCE: Robert Uram, "Coal Exchanges," contractor report to OTA, Dec. 23, 1983.

protection through exchanges. Congress frequently gives Federal agencies condemnation powers to carry out specific projects; mandatory exchanges would involve similar activity. However, some recent experience shows that exchange availability may be eased by covering exchange possibilities more explicitly during land use planning. This also would eliminate the need to go back and amend plans when a particular proposal is suggested.

BLM recently issued a written policy statement outlining the circumstances under which fee exchanges of leasable and salable minerals may be granted. But that policy statement essentially is limited to a list of 12 factors that field offices should consider in determining if a fee exchange would be in the public interest. Those factors are:

1. The exchange would consolidate Federal holdings into a logical mining unit(s).
2. The exchange would consolidate non-Federal holdings into a logical mining unit(s).
3. The exchange would serve a national resource management or protection need.
4. The exchange would simplify jurisdiction and allow Federal land use planning efforts to be confined to an area in which the United States controls the mineral development.
5. The exchange would reunite Federal surface and subsurface estates.
6. The exchange would eliminate isolated tracts and checkerboard patterns of Federal minerals.
7. The exchange would achieve a management goal without using appropriated funds to pay for the resources needed by the United States.
8. The exchange would meet needs of State and local people.
9. The non-Federal lands to be received in the exchange would serve the public better in public ownership than the minerals to be transferred in the exchange.
10. The exchange would enhance competitive bidding for the Federal minerals.
11. The potential revenue from a lease or sale of the Federal minerals consolidated by the exchange would be greater than the potential revenue from a lease or sale of the minerals in Federal ownership prior to the exchange.
12. The exchange does not involve a transfer of a fee interest in Federal minerals for a less than fee interest (e.g., conservation or scenic easements) in non-Federal lands. If a less than fee interest in non-Federal lands is all that is needed, a fee exchange shall be followed by a competitive bidding, or a modified competitive bidding, or a modified competitive bidding, sale of the unneeded interests as the situation dictates.

One or more of these factors must be present in any fee exchange proposal, and an exchange that would have an opposite effect to any factor should not be pursued. While this policy statement is a worthwhile start on developing guidelines for effecting exchanges, it still does not provide sufficient guidance to field personnel and is only applicable to fee exchanges. Lease exchanges still need congressional authorization.

In developing an effective exchange program, BLM needs to pay particular attention to environmental analysis of exchange tracts. This became an issue in a recent exchange that was, at least in part, environmentally motivated, when it was discovered after the exchange was complete that the tract the company was given includes potentially valuable wildlife habitat.

A second factor that influences the extent to which exchanges can be used is the willingness of the industry to accept the bidding rights Interior offers in an exchange. In the case of fee coal exchanges, where the holder of a coal right receives unleased and unencumbered Federal coal, there appears to be no bar to ready acceptance of the rights granted. Along with the economic benefits from "blocking up" checkerboard areas, the elimination of Federal supervision and diligence and royalty provisions may be factors influencing the easy acceptability of fee coal exchanges.

There is the possibility that exchanges would be suggested most often in situations where agency or public pressure or other legal impediments may make mining of an existing leaseholding quite difficult. In such cases, the assurance of receiving a bidding right in exchange for a tract that cannot be developed without serious resistance may more than compensate for any real or perceived problems with Federal leasing or bidding rights. It is clear, however, that the continued inability of Interior to lease coal regularly and without conflict will continue to be an impediment to lease exchanges for bidding rights because companies accepting such rights have little assurance of when or even if they will be able to exercise them.

An additional question is whether the exercise of a certificate of bidding rights issued in exchange for a coal lease or a PRLA should be considered a distribution of funds to a State under 30 U.S.C. 191. The Department does not consider an exercise of a bidding right to be a distribution of revenues, but to date, no bidding rights have been issued under DOI's general regulations. If DOI's interpretation is correct, a significant exchange program could result in the loss of revenues to a State in which a bidding right is exercised (compared to the distribution of bonus payments, royalties, etc., under a normal lease). However, as noted above, issuing bidding rights instead of a direct exchange for another parcel of land could present significant cost savings for BLM. Bidding rights also eliminate the potential for an exchange resulting in a coal lease being issued on a noncompetitive basis.

BLM also must resolve outstanding issues about the entities eligible to participate in exchanges. The major question here is whether the fee exchange provisions in Section 206 of FLPMA allow unleased Federal coal to be transferred to entities (primarily railroad companies) that otherwise are not allowed to hold Federal coal leases under Section 2(c) of the Mineral Leasing Act of 1920. This issue principally affects coal in "checkerboard" areas where DOI has proposed or contemplated exchanges with railroad companies or their subsidiaries. The purpose of these kinds of exchanges would be to consolidate land ownership patterns to enable formation of logical mining units.

Another major area of uncertainty is valuation procedures for the minerals involved. Such procedures are relatively well-defined for **land** exchanges, but these are inappropriate for use in the majority of mineral exchanges. BLM feels that detailed procedures for value determination are more appropriately addressed in the BLM manual and in instruction and guidance memoranda rather than the program regulations. However, as in other areas discussed previously (e.g., guidelines and standards for data adequacy), while such internal documents provide greater flexibility for BLM, they are not subject to formal public review and comment, and can be changed more easily than regulations. If such regulations were drafted skillfully they could provide sufficient guidance to facilitate more effective participation by coal companies and other interested groups without undermining the Bureau's need for flexibility. The general guidance in such regulations could then be supplemented by internal memoranda and the BLM manual. Furthermore, some of Interior's valuation problems may be eased if it were to use publicly available, rather than proprietary, models. Frequently it uses a proprietary model, which complicates the ability of the affected company and the public to evaluate and criticize the assumptions leading to the equal value determination.

The usefulness of the exchange program ultimately depends on the amount of resources Interior is willing or able to devote to them. Even in economic exchanges, Interior has found that exchanges require a high commitment of Departmental resources compared to direct leasing. This is because of the need to evaluate two parcels (the offered and selected lands) to end up with only a single leasable parcel. Where coal is being acquired through exchange for environmental protection (as in the Bisti exchange), Interior must expend considerable resources with no opportunity for an economic return on those resources.

Exchanges could be a valuable tool for resolving conflicts over environmentally sensitive lease tracts if all of the issues discussed above were resolved, and if BLM had authority to pursue **lease** exchanges. Until these and other related problems are resolved, however, the ability of Interior to complete exchanges will be constrained.

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Appendixes

Appendix A
Environmental Laws

In addition to the specific requirements of the Federal Coal Leasing Amendments Act (FCLAA) and the Federal Land Policy and Management Act (FLPMA) related to environmental planning and assessment, a number of other environmental laws apply to the Federal coal management program. These include the Surface Mining Control and Reclamation Act, the National Environmental Policy Act, and the Clean Air and Water Acts. This section will briefly describe the provisions of these laws as they relate to surface mining operations, discuss the impacts of mining to which they pertain, and review issues raised by the implementation of these acts in the coal program. A list of other environmental laws that may affect leasing or mining in the West may be found at the end of chapter 3.

Surface Mining Control and Reclamation Act

Congress approved the Surface Mining Control and Reclamation Act (SMCRA) (Public Law 95-87, 30 U.S.C. 1201 et seq.) in August 1977. SMCRA establishes a detailed national program for addressing the environmental effects of coal mining. Of particular importance are the act's requirements that surface coal mining operations be conducted in accordance with environmental protection performance standards (sec. 515), and that Federal lands be reviewed to determine their acceptability for all or certain types of surface mining, either as part of land use planning processes at the Federal, State, and local levels, or as a result of an unsuitability petition (sec. 522). SMCRA requires operators to post a bond to insure the mined land is reclaimed.

The performance standards of section 515 are minimum standards applicable to various aspects of the mining and reclamation process. Under SMCRA, the States may, if they choose, impose standards that are more stringent. Among other things, the standards require:

- maximum utilization and conservation of the coal being recovered;
- restoration of disturbed land to original or better conditions;
- restoration to the approximate original contour of the land surface;
- stabilization and protection of all surface areas;
- protection of prime farmlands through specific reclamation techniques;
- minimization of disturbances to the existing hydrologic balance; and
- limitation of mining on steep slopes.

Section 522 of SMCRA establishes a procedure for designating lands as unsuitable for all or certain types of coal mining operations. The Secretary of the Interior determines unsuitability for Federal lands, while States have authority over non-Federal lands. Section 522(a) provides specific unsuitability criteria which define categories of land that must be protected from, or during, mining (incorporated in the Bureau of Land Management's (BLM) land use planning regulations as criteria #1, #3, and #7). Interested parties also may petition the permitting agency (the Office of Surface Mining or a State regulatory agency in States with approved programs) to have areas designated unsuitable; the petition must be granted if it is determined that reclamation of disturbed lands is not economically or technologically feasible. Unsuitability status also may be granted, if as a result of the petition, it is determined that mining operations will:

- be incompatible with existing land use plans;
- significantly affect important fragile or historic lands;
- result in substantial loss or reduction in the productivity of renewable resource lands which produce food or fiber; or
- substantially endanger life and property in natural hazard lands (i.e., areas subject to frequent flooding and areas of unstable geology).

Federal Agencies

SMCRA also created the Office of Surface Mining Reclamation and Control (OSM) within the Department of the Interior (DOI) to implement the statute's various programs. OSM reviews and approves/disapproves State programs for controlling surface mining operations (and abandoned mine lands). The act originally provided for slightly less than 3 years of Federal enforcement of State-issued operating permits implementing the most stringent of the act's performance standards (known as the "interim regulatory program"). At the end of three years (June 3, 1980), primary regulatory responsibility for the program was to have shifted to those States whose proposed program for assuming regulatory primacy had been approved by DOI. In those States in which primacy was not achieved, a Federal program is to be implemented and administered by OSM. Three and one-half years after enactment of the statute, all mining operations were to have been in compliance with permits issued in accordance with the full range of regulatory requirements, as administered by either the States or OSM.

Because substantial Western coal reserves are owned by the Federal Government, OSM has had direct responsibility not only for enforcing the act's regulatory requirements, but also for issuing operating permits on specific mines. The responsibility for overseeing mining activities on Federal lands, lies primarily with OSM, as assisted by the Bureau of Land Management, the U.S. Forest Service, and the U.S. Geological Survey, as well as with those Western States with Federal lands within their boundaries that have approved permitting programs and have signed cooperative agreements with DOI.

BLM is the leading agency for Federal minerals including resource conservation, diligence, and royalties under the Mineral Leasing Act. Under a variety of Federal statutes, BLM also is responsible for the management and protection of surface resources on public domain lands. BLM can set post-mining land use performance bond limits to assure protection of these resources. The Forest Service performs a similar role for National Forest lands.

OSM, with the concurrence of BLM and the Forest Service, submits recommendations to the Secretary of the Interior concerning the approval or disapproval of mine plan applications. The Forest Service must consent to the issuance of mine plan approvals for mines within the boundaries of any National Forest. Applicable Federal, State, and local agencies retain similar authority with respect to mines that might adversely affect any public park or site included in the National Register of Historic Sites.

States

Each of the Western States with significant coal reserves had enacted surface mining legislation in the 1970's prior to passage of SMCRA. The stringency of the pre-SMCRA State programs varied significantly, with Wyoming and Montana generally recognized as having had the most stringent programs, and Utah and New Mexico the least stringent. All of the Western States have revised their programs to comply with SMCRA, and have received approval of their permanent regulatory programs and have qualified for assumption of primary regulatory jurisdiction of surface mining and reclamation.

Thus, the States have assumed primary responsibility for mine plan compliance and enforcement of the Act's requirements. Those States with approved permit plans that have entered into a cooperative agreement with DOI also have the authority to regulate mining on Federal lands within their boundaries. The Secretary of the Interior, however, retains the authority to approve or disapprove mining plans on Federal lands and to designate Federal lands unsuitable for mining.

State Permit Programs.—To accomplish the goals established by the Act, State permit programs for surface mines and for surface operations of underground mines were mandated. Each application for a surface coal mining and reclamation permit must include detailed information about the type and method of coal mining operation and the engineering techniques and equipment to be used; the probable hydrologic consequences of the mining and reclamation, both on and off the mine site; any manmade features or significant archaeological sites that may be affected by mining; the geological and physical characteristics of the coal, including a chemical analysis of potentially acid- or toxic-forming strata; a soil survey of potential prime farmland; and the reclamation plan.

The probable hydrologic consequences of mining and reclamation must be determined relative to the hydrologic regime and the quantity and quality of surface and groundwater systems including dissolved and suspended solids under seasonal flow conditions. Sufficient data must be collected to enable the regulatory agency to assess the probable **cumulative** impacts of **all** mining in the area on hydrology and water availability.

The reclamation plan must describe the condition of the land prior to mining including its existing and potential land uses and its productivity as well as its average yield of food, fiber, forage, or wood products under optimum management. The plan also must specify the proposed post-mining land use and describe in detail how this use will be achieved including the engineering techniques and equipment to be used, the cost per acre of reclamation, and a detailed timetable for accomplishing reclamation. In addition, the plan must describe the means of compliance with applicable air and water quality and health and safety regulations.

All surface mining permits issued under the Act must require that the coal mining operations meet all applicable environmental protection performance standards. These standards govern the maximum recovery of fuel; restoration of the land to its approximate original contour; use of explosives; waste disposal, including the use of waste piles as dams or embankments; construction of access roads; and revegetation. Additional, more stringent standards apply to environmentally sensitive areas such as prime farmland, steep slopes, alluvial valley floors, and timber lands.

Permits for **underground** mining also must require the mine operator to prevent subsidence to the extent possible, seal all openings to the surface, and prevent acid or other toxic drainage.

Water Resource Impacts

OSM and the Environmental Protection Agency (EPA) are the principal Federal agencies responsible for review of water resource impacts of coal mining activities. Water resource data are major components of a mine permit application, and compliance with water resource performance standards must be demonstrated before an application can be approved.

Section 515(b) of SMCRA establishes performance standards related to water resource impacts. These include:

- control of discharges from mining and reclamation activities.
- control of erosion and attendant water pollution;
- impoundment of water on mining sites; and
- protection of groundwater recharge capacity.

Control of discharges from mining and reclamation activities is regulated by OSM, the State regulatory authority, and the agency responsible for implementation of the Clean Water Act in each State (see below). The Clean Water Act requires mining operations to obtain discharge permits and to comply with EPA or State effluent limitations. However, the Clean Water Act permit system applies only during the active phase of mining. Under SMCRA all water discharged as a result of coal mining and reclamation activities is regulated. Effluent limitations established by OSM are generally similar to those adopted by EPA.

Also, OSM regulations require sediment control measures using the "best technology currently available" and minimum standards for permanent and temporary impoundments as part of reclamation activities. Permanent impoundments may be constructed only if size and design criteria are adequate to ensure stability, safety, and access. In addition, SMCRA requires that the recharge capability of the mined area be restored to the approximate pre-mining condition. Furthermore, mine operators are required to monitor groundwater and surface water quantity and quality on the permit area and in the surrounding area before, during, and after mining.

Alluvial Valley Floors

Under provisions of SMCRA, alluvial valley floors* (AVFs) in the Western United States are given special protection because of their agricultural and hydrologic importance. The more important AVFs are protected from coal mining and its associated disturbance. The less important AVFs may be mined, but standards for reclamation are higher than for other types of mined areas.

Section 510(b)(5) of the act allows the Secretary of the Interior to exchange unleased Federal coal reserves for existing leases or non-Federal lands that cannot be mined because of AVF designations provided that coal is not yet being produced from the mine and the operator had made a substantial legal or financial commitment to develop a mine before January 1, 1977. The Act also requires the Secretary to exchange non-Federal coal lands in AVFs that cannot be mined for available Federal coal lands of comparable value; these exchanges are not subject to the requirement of substantial legal and financial investments.

The impact of the AVF statutory provisions, adopted regulations, and guidelines have been the subject of continued debate among industry and regulating Government agencies. Industry has claimed that the AVF provisions are overly complex, lead to significant delays in processing permits, and may ultimately lead to significant loss of recoverable reserves.

National Environmental Policy Act

The National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 et seq.) restructured Federal agency decisionmaking in favor of a systematic, interdisciplinary approach that would ensure that environmental amenities and values receive appropriate consideration along with the traditional economic and technical factors. NEPA was the first major environmental legislation approved by Congress, and it has remained the most far-reaching in scope.

In general, NEPA has a threefold purpose: 1) to declare a national policy to create and maintain conditions under which man and nature can exist in productive harmony and can fulfill the social, economic, and other requirements of present and future generations; 2) to increase the understanding of ecological systems and natural resources; and 3) to promote efforts that will prevent or eliminate damage to the environment. As one means of achieving these purposes, NEPA requires all Federal agencies to include a detailed statement in every recommendation or report on proposals for legislation and other ". . . major Federal actions significantly affecting the quality of the human environment . . . " that describes:

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*Alluvial vallley floors are those stream valleys in the Western United States which: 1) are underlain by unconsolidated gravel, sand, silt, and clay; 2) have a stream flowing through them; 3) have a generally flat valley floor topographic surface; and 4) have an agricultural importance. The relative importance of these valleys is a function of the water supplies available in the specific valley area. The agricultural activities generally include irrigated or subirrigated hay lands, developed pasture lands, critically important grazing areas, or lands that could be developed for any of these purposes.

- possible environmental impacts of the proposed Federal action,
- any adverse environmental effects that cannot be avoided should the proposed action be implemented,
- alternatives to the proposed action and their environmental impacts,
- the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity as it applies to proposed Federal actions, and
- any irreversible and irretrievable commitments of resources that would result from implementation of the proposed action.

All coal-related activities that have a significant impact on the environment and that need Federal authorization require an environmental impact statement (EIS). This includes regional coal lease sales on Federal lands, large coal conversion facilities, and, in some cases, permits to conduct surface mining operations on Federal lands. Although permits issued by the EPA under the Clean Air and Water Acts are exempt from the EIS requirement, those acts require separate analyses of a project's impact on the environment (see below). Regulations to guide the implementation of NEPA have been promulgated by the Council on Environmental Quality (CEQ) (40 C.F.R. 1500-1508). A large body of Federal case law has further defined NEPA requirements, particularly with regard to the scope and contents of EISs.

In order to determine whether a proposed action is "major" and if it "significantly" affects the environment, Federal agencies are required to prepare environmental assessments (EAs). These provide a brief examination and analysis of proposed actions and of alternatives to those actions, a discussion of the need for the proposed action, an examination of the environmental impacts of the proposed actions and alternatives, and a list of government agencies and people consulted during the preparation of the EA. Environmental assessments are public documents. If an EA indicates that an action is not "major" or that it will not "significantly" affect the environment, the CEQ regulations allow the agency to make a "finding of no significant impact" (FONSI). Such findings must be published with an explanation of the basis for the agency determination. No detailed EISs are required for actions which are found not to have significant impacts.

An EIS is prepared by BLM for each regional coal lease sale during activity planning, immediately following the ranking of tracts and selection of alternatives by the Regional Coal Team (RCT). The EIS must analyze site- specificenvironmental impacts on each tract or combinations of tracts (alternatives) being considered for leasing; the cumulative environmental impacts from each preferred or alternative combination of lease tracts and sale schedules; and the potential effects of a "no action" alternative (usually either no new leasing, or no competitive leasing). Under the current leasing program regulations, the EIS is the only point pre-leasing at which cumulative impacts must be assessed. However, approval of a land use plan (Resource Management Plan—RMP) under FLPMA has been determined to be a major action significantly affecting the environment, and the environmental analysis of alternatives is an integral part of the RMP process. Thus, as RMPs are prepared, the consideration of cumulative impacts from land use planning decisions will be included in the decisionmaking process before the completion of tract ranking and the selection of alternatives.

CEQ regulations implementing NEPA also require the preparation of an EIS when rulemaking is initiated by significant new circumstances or information relevant to environmental concerns, and thus is anticipated to have a significant impact on the environment. The initiation of the new Federal coal management program in 1979 was accompanied by a detailed programmatic EIS prepared in accordance with NEPA. When those regulations were revised in 1982-83, DOI prepared an EA that concluded that a second full EIS to analyze those revisions would not be necessary (FONSI). One basis for this decision was that the revisions to the regulations are sufficiently close to one of the leasing alternatives discussed in the 1979 Programmatic EIS that preparation of a supplemental EIS was considered unnecessary.

Critics of that decision assert that the EA did not take a sufficiently "hard look" at the impact of leasing changes to justify a "finding of no significant impact." They argue that the revised regulations included significant new circumstances or information compared to the coal program studied in the 1979 Programmatic EIS, and therefore merited a revised EIS. To support this argument, the critics cite the substantive changes in the methodology for setting regional leasing levels in the 1982 regulations which resulted in significant increases in those levels. Furthermore, the critics note that, since the 1979 EIS, a number of in-depth analyses of Federal coal development issues have been conducted (including the 1981 OTA report *An Assessment of the Development and Production Potential of Federal Coal Leases*), that introduced new data that were unavailable in 1979.

The Clean Air Act

The Clean Air Act establishes a national system of air quality regulation. Before 1970, air pollution control essentially was left to the States, with the Federal Government providing technical and financial assistance for planning and research and development. Under the Act, EPA is responsible for implementing Federal regulations and standards; States are mandated to devise State implementation plans (SIPs) and, in the absence of State action, Federal intervention is required.

The central feature of the 1970 Clean Air Act Amendments was the requirement that EPA promulgate National Ambient Air Quality Standards (NAAQS). The NAAQS define air quality in terms of ambient concentration of pollutants. While these standards do not regulate emissions from individual sources, they do represent target levels for air quality. Under the Clean Air Act, two types of ambient air quality standards are designated: primary standards, which are designed to protect human health; and secondary standards, which are intended to safeguard public welfare.

Pursuant to the 1970 Clean Air Act Amendments, EPA identified six pollutants as having potentially adverse effects on public health and welfare, and established primary and secondary NAAQS for each. These pollutants are sulfur oxides (SOx), particulate matter, nitrogen dioxide (NO_2), hydrocarbons, photochemical oxidants, carbon monoxide, ozone, and lead.

So that pollution control programs can be managed locally, 247 air quality control regions (AQCR) were designated. Each AQCR is classified as to whether it meets national standards. The classification of an area with respect to ambient air quality has important consequences. Regions that are found by EPA to be in nonattainment status are subject to a particular set of restrictions ("offset" requirements) under the Act. Nondegradation regions (where air is cleaner than the standards), are subject to a different set of regulations, which are intended for "prevention of significant deterioration" (PSD). Regardless of an area's classification, almost every new major source of emissions is required to undergo a preconstruction review.

State Implementation Plans

The State role centers on the preparation and implementation of a plan, consistent with EPA guidelines, that sets out control strategies for meeting and maintaining NAAQS in various parts of the State. States have considerable discretion in deciding what emission limitations and other controls on individual sources to use in cleaning up their air, as long as their SIPs are shown to be capable of achieving the national standards. State plans must include an enforceable permit program for regulating construction or operation of any new major stationary source in nonattainment areas or significant modification to an existing facility.

Prevention of Significant Deterioration

The 1970 Clean Air Act Amendments did not address the question of air quality in areas already cleaner than NAAQS require. In 1972, environmental groups brought suit against the EPA to prohibit the administration's approval of SIPs that failed to prevent significant deterioration of air quality. The outcome of the legal action was a court order that EPA develop a program to prevent the degradation of air quality in clean areas. In 1974, PSD regulations were promulgated and incorporated into all SIPs and in 1977 were incorporated in the act with some changes.

In general, the PSD program divides clean air areas into three classes. Certain National Parks, wilderness areas, and monuments that existed when the Act was passed were immediately designated as class I areas. Class I areas are subject to the lowest PSD increments and are primarily valued for their scenic beauty. All other clean air areas were designated class II. In class II areas, some additional air pollution and moderate industrial growth were allowed. Individual States or Indian Tribal governing bodies can redesignate some class II areas as class III areas where major industrial development is foreseen. In class III areas, air pollution up to one-half the level of the secondary standards would be permitted. The States or Indian Tribes also can redesignate class II areas as class I. Either type of redesignation is subject to hearings and consultations with the managers of affected Federal lands, or States in the case of Indian action, and approval by EPA.

All SIPs must specify emission limitations and other standards for each class area. Maximum allowable concentrations for a specified period of exposure must not exceed the applicable primary or secondary NAAQS. whichever is stricter.

To obtain a permit for a facility in a nondegradation area, a special preconstruction review must demonstrate that it will not cause air pollution in excess of NAAQS or PSD standards more than once per year in any AQCR. Best available control technology (BACT) must be used for all pollutants regulated by the Act, and the effects of the emissions from the facility on the ambient air quality in the areas of interest must be predicted. Impacts on air quality that could result from any growth associated with the facility must also be analyzed. The PSD impact projections are cumulative for the region of the source. Additional assessments of the effects on visibility in class I areas and on air quality-related values also must be included in the PSD review.

Fugitive dust emissions currently are excluded from the PSD regulations, and coal mines are not subject to PSD review. State air permits are required for most coal mines, but State PSD permits would only be required if projected emissions were very high (250 million tons per year or greater).

Mining Activities

Air quality concerns regarding coal mining activities focus on fugitive dust and its effect on total suspended particulates (TSP). Thus far, air quality concerns have had only a minor effect on Western coal development. For example, in some areas of the Powder River Coal Region, fugitive dust emissions have exceeded the National Ambient Air Quality Standards, and mining operations have had to adopt better dust control measures. However, the level of production in this region has not been constrained by air quality standards. Currently, emissions (88 million tons annually) are far below the permitted air quality capacity of 250 million to 290 million tons annually.

Roads are the major source of fugitive dust from surface coal mining operators. Other sources of fugitive dust are trains, coal storage and processing facilities, spoil piles, and reclamation areas. Methods for controlling fugitive dust emissions include: 1) periodic watering and chemical stabilization of unpaved roads; 2) paving roads; 3) enclosing, watering, or treading haul trucks and railroad cars; 4) substituting conveyor systems for haul trucks; 5) minimizing the area of disturbed land; 6) prompt revegetation of regraded lands; and 7) covering coal storage areas. Each surface mine in the West employs at least one of these methods. For example, many mines now enclose their coal storage areas and all mines water haul roads and revegetate topsoil stockpiles.

The Clean Water Act

The Clean Water Act establishes national water quality goals that call for the protection and propagation of fish and wildlife, and the elimination of all pollutant discharges. The States have the primary responsibility for achieving these goals and for planning the development and use of land and water resources consistent with them. Each State is required to develop and implement, subject to EPA approval, a comprehensive water quality management plan that includes water quality standards. These standards consist of the designated uses of the waters involved, including their use and value for public water supplies; propagation of fish and wildlife; recreational, agricultural, industrial, and other purposes; and navigation. In addition, the standards include water quality criteria for the waters based on these uses.

In general, the water quality standards are to be achieved through effluent limitations on discharges from point sources. However, for those waters for which the effluent limitations are not stringent enough to implement the applicable water quality standard, the State must establish a total maximum daily load for the relevant pollutants. This load must be set at the level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety that takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality.

No comprehensive Federal policy for water resource management has been established. The availability of water and restrictions on its usage are the responsibility of States and Interstate Water Commissions. In all Western States, water supplies diminished or degraded by mining activities are required to be replaced by the operator.

Effluent Limitations

Effluent limitations are restrictions established by a State or EPA on quantities, rates, and concentrations of chemical, physical, biological, and other constituents that are discharged from point sources. Effluent limitations may be categorized by: 1) the sources for which they have been established, 2) whether those sources discharge directly into receiving waters or into a publicly owned treatment works, and 3) the degrees of control required for each category of sources or pollutants and the dates those controls become mandatory. Effluent limitations for coal mines regulate discharges of iron, manganese, and total suspended solids, as well as the pH.

In general, the 1977 Amendments require all categories of point sources to apply the best practicable control technology currently available in order to meet the effluent limitations. Slightly more or less stringent technological controls may be imposed, depending on the source category and the type of effluent. In determining the control measures and practices to be applicable to point sources, EPA must take into account: the age of equipment and facilities involved; the process employed; the engineering aspects of the various types of control technologies; process changes; nonwater quality environmental impacts (including energy requirements); and the total cost of achieving the limitation in relation to the effluent reduction benefits to be achieved.

Permit Systems

Effluent limitations and water quality standards are implemented through State certification programs and through the National Pollutant Discharge Elimination System (NPDES). An applicant for a Federal license or permit to conduct any activity that may result in a discharge into navigable waters must obtain State certification that the discharge will not violate any effluent limitations, water quality standards, or New Source Performance Standards (NSPS). Where the discharge will affect more than one State, the Federal licensing or permitting agency must condition the permit to ensure that all water quality requirements will be met. In addition, when Federal regulations require only a **construction** permit, the certifying State must be given an opportunity to review the manner in which the facility will be **operated** in order to ensure that water quality requirements will not be violated. If the State finds that the operation of the facility will result in violations, the Federal agency may suspend the license or permit.

NPDES is designed to ensure the orderly and timely achievement of water quality goals without sacrificing economic or energy growth. Under NPDES, a facility may be issued a permit for a discharge on the condition that the discharge will meet all applicable water quality requirements. NPDES permits are issued under EPA-approved State programs, or, where a State program has not been approved, by EPA. The permits are for fixed terms not to exceed 5 years and can be terminated or modified for violations. Compliance with the conditions under which an NPDES permit is issued is deemed compliance with the effluent limitations and water quality standards promulgated under the Clean Water Act.

Water Availability and Quality Impacts from Mining

Coal mining activities disrupt groundwater flow and quality. Opening a pit for surface mining affects the level and flow of groundwaters. The mine pit will intercept all groundwater found above the pit floor. Groundwater may change direction or even reverse as water surrounding the pit flows toward the pit. As water flows into the pit, water levels in surrounding areas will fall. Ultimately, an equilibrium condition will be established. When this condition is reached, however, depends on the characteristics of the aquifers (water-transmitting rocks) and the length of time the pits are open.

Water quality also can be affected by coal mining activities. Groundwater moving through backfilled surface mines is known to have substantially increased concentrations of total dissolved solids and other constituents. In addition, erosion of mine and reclamation areas can increase sediment loads in streams. Also, surface waters can be affected by slippage of polluted groundwaters into receiving streams.

Because of these impacts, effluent limitations have been established for mining operations, broken down into those applicable to acid drainage and alkaline discharge. Under the Clean Water Act, mining operations must obtain discharge permits and comply with EPA or State effluent limitations for point source discharges of pollutants to surface waters. However, the Clean Water Act permit system applies only during the active phase of mining including secondary recovery facilities and preparation plants; it does **not** extend to reclamation, nor does it cover nonpoint pollution sources or consider discharges to groundwater. These impacts must be addressed through the mining and reclamation permit under SMCRA.

The EPA may modify any of the limitations for a point source if the owner of the source demonstrates that the modified requirement will represent the maximum use of technology within his economic capability and will result in reasonable further progress toward the discharge elimination goal. The 1977 amendments provide that such a modification is mandatory if the owner also demonstrates that it will not interfere with attainment of a water quality standard, and it will not result in additional requirements on any other point source.

Appendix B

Formulas for Determining Regional Leasing Levels[a]

Formulas:

Basic formula:

Annual shortfall * (Average mine life * (percent Federal)) = Leasing level

1. *Production Method:*
   Production forecasts − Productive capacity = Annual shortfall
2. *Inventory Method:*
   Inventory factor * Production forecasts = Inventory requirement
   Inventory requirement − Productive capacity = Annual shortfall
3. *Contracting Rate Method:*
   Productive capacity − Contracted coal = Residual capacity
   Annual new contracting * Years between sales = New contracting
   Average new contract * (Inventory factor * Competition factor) = Minimum inventory
   Minimum inventory + New contracting = Full inventory
   Full inventory − Residual capacity = Annual shortfall
4. *Expressions of Interest Method:*
   Expressions of interest − Nonthorough expressions = Thorough expressions
   Thorough expressions − Duplicate expressions = Leasing level
5. *Minimum Leasing Method:*
   Maintenance tracts + Bypass tracts + Expansion tonnage + New production opportunities = Leasing level

Example of use of formulas:

Variable value:

Target year (TY) = 1995
Productive capacity for TY = 50 MTY[b]
Production forecasts for TY = 49 MTY (low)
= 55 MTY (medium)
= 64 MTY (high)
Coal under contract for TY = 46 MTY
Average mine life = 30 years
Percent Federal ownership = 75%
Years between Federal lease sales = 4 years
Annual production from new contracting = 2.0 MTY (low)
= 2.5 MTY (medium)
= 3.1 MTY (high)
Inventory factor = 0.5 (low)
= 2 (medium)
= 3 (high)

Competition factor = 5 bidders
Annual production from average new contract = 1.1 MTY
Expressions of interest = 1.7 BT[c]
Nonthorough expressions = 0.5 BT
Duplicate expressions = 0.3 BT
Maintenance tracts = 100 MT
Bypass tracts = 0 MT

Expansion tracts = 200 MT
New production opportunity = 100 MT

1. $(49-50) * (30 * 0.75) = 0$ MT
   $(55-50) * (30 * 0.75) = 112.5$ MT
   $(64-50) * (30 * 0.75) = 315.0$ MT
2. $((2 * 49)-50) * (30 * 0.75) = 1{,}080$ MT
   $((2 * 55)-50) * (30 * 0.75) = 1{,}350$ MT
   $((2 * 64)-50) * (30 * 0.75) = 1{,}755$ MT
3. $[((1.1 * 2 * 5) + (2.0 * 4))-(50-46)] * (30 * 0.75) = 337.5$ MT
   $[((1.1 * 2 * 5) + (2.5 * 4))-(50-46)] * (30 * 0.75) = 382.5$ MT
   $[((1.1 * 2 * 5) + (3.1 * 4))-(50-46)] * (30 * 0.75) = 436.5$ MT
4. $(1.7-0.5)-0.3 = 900$ MT
5. $100 + 200 = 300$ MT
   $100 + 200 + 100 = 400$ MT

Summary of Results of Formulas (million tons recoverable resource)

Method	*Low*	*Medium*	*High*
Production	0	112.5	315.0
Inventory	1,080.0	1,350.0	1,755.0
Contracting rate	337.5	382.5	436.5
Expressions of interest	—	900.0	—
Minimum leasing	300.0	—	400.0
DOI initial leasing level range:			
From these formulas	300.0	—	1,700.0
From pre-1982 method	0.0	—	650.0

[a] Source: Bureau of Land Management, U.S. Department of the Interior, *Regional Leasing Levels,* preliminary draft, Nov. 22, 1982.

[b] "MTY" means million tons per year.

[c] "BT" means billion tons.

Appendix C
Acronyms and Glossary

Acronyms

ACEC —area of critical environmental concern
AVF —alluvial valley floor
BIA —Bureau of Indian Affairs
BLM —Bureau of Land Management
BOM —Bureau of Mines
Btu —British thermal unit
CEQ —Council on Environmental Quality
CERT —Council of Energy Resource Tribes
CFR —Code of Federal Regulations
DOE —Department of Energy
DOI —Department of the Interior
EA —environmental assessment
EIS —environmental impact statement
EMARS —Energy Minerals Activity Recommendation System
F&WS —Fish and Wildlife Service
FCLAA —Federal Coal Leasing Amendments Act of 1976
FLPMA —Federal Land Policy and Management Act of 1976
LMU —logical mining unit
MFP —Management Framework Plan
MLTF —Mineral Lease Task Force (Utah)
MMS —Minerals Management Service
NEPA —National Environmental Policy Act of 1969
NO_x —nitrogen oxide
NRDC —Natural Resources Defense Council
OSM —Office of Surface Mining
OTA —Office of Technology Assessment
PRLA —Preference Right Lease Application
RCT —Regional Coal Team
RMP —Resource Management Plan
SID —Secretarial Issue Document
SMCRA —Surface Mining Control and Reclamation Act of 1977
SO_2 —sulfur dioxide
SSA —site specific analysis
TSP —total suspended particulates
USC —United States Code
USFS —United States Forest Service
USGS —United States Geological Survey
WSA —wilderness study area

Glossary

Activity planning: Planning for the development or use of specific resources on public domain lands (e.g., for a coal lease sale).

Alluvial valley floor: Those stream valleys located west of the 100th Meridian which: 1) are underlain by unconsolidated gravel, sand, silt, and clay; 2) have a stream flowing through them; 3) have a generally flat valley floor topographic surface; and 4) are agriculturally important. The relative importance of these valleys is a function of the water supplies available in the specific valley area. The agricultural activities generally include irrigated or subirrigated hay lands, developed pasture lands, critically important grazing areas, or lands that could be developed for any of these purposes.

Areas of critical environmental concern: Areas within the public lands where special management attention is required (when such areas are developed or used, or where no development is required) to protect, and prevent irreparable damage to, important historic, cultural, or scenic values, fish and wildlife resources or other natural systems or processes, or to protect life and safety from natural hazards.

Aquifer: A subsurface zone that yields economically important amounts of water to wells; a water-bearing stratum or permeable rock, sand, or gravel.

British thermal unit: The quantity of heat energy required to raise the temperature of 1 lb of water 1 °F at or near its point of maximum density.

Bypass coal: An isolated coal deposit that cannot, for the foreseeable future, be mined economically and in an environmentally sound manner either separately or as part of any mining operation other than that of the applicant for either an emergency lease or a lease modification.

Certificate of bidding rights: A right granted by the Secretary of the Interior to apply the fair market value of a relinquished coal or other mineral lease, or right to a preference right lease, as a credit against the bonus bid or bids on a competitive lease acquired at a lease sale, or as a credit against the payment required for a coal lease modification.

Continuous operation: Requirement that a Federal lease must produce at least an annual average of one percent of logical mining unit reserves after diligent development has been achieved.

Development potential: The prospects for a lease or lease block being developed and mined within the next decade, taking into consideration the reserves, mining conditions, geographic location, status of adjacent properties, surface resource values, environmental impacts, potential markets, transportation availability, and community infrastructure.

Diligent development: Actual production of commercial quantities of coal from a Federal lease or the logical mining unit of which the lease is a part within 10 years after the lease is issued.

Land use planning: Development of a multiple resource use management strategy for the administration of public lands through identification of all potential land and resource uses and of opportunities for the development of particular resources based on their relative values.

Management Framework Plan: A land use plan prepared prior to passage of the Federal Land Policy and Management Act of 1976.

Mine plan: A detailed description of the operator's proposed method, rate, and sequence of mining, environmental protection measures, and reclamation strategies for a coal mine with Federal leases submitted to the Office of Surface Mining or State regulatory authority pursuant to the Surface Mining Control and Reclamation Act of 1977.

Multiple use: Management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; the use of some land for less than all of the resources; a combination of balanced and diverse resource uses that takes into account the long-term needs of future generations for renewable and nonrenewable resources, including, but not limited to, recreation, range, timber, minerals, watershed, wildlife and fish, and natural scenic, scientific and historical values; and harmonious and coordinated management of the various resources without permanent impairment of the productivity of the land and the quality of the environment, with consideration being given to the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output.

Preference right lease application: An application for a noncompetitive coal lease issued to the holder of a prospecting permit who discovers coal in commercial quantities on the land for which the permit was issued.

Resource Management Plan: A land use plan as prescribed by the Federal Land Policy and Management Act of 1976.

Split estate: Land in which the ownership of the surface is held by persons, including governmental bodies, other than the Federal Government, and the ownership of underlying coal is, in whole or in part, reserved to the Federal Government.

Threshold levels: Specific defined levels of resource use, production or development which are established as maximum or minimum constraints in the resource management plan. Threshold levels are usually established to ensure that the plan does not permit an unacceptable level of cumulative impacts.

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Office of Technology Assessment

The Office of Technology Assessment (OTA) was created in 1972 as an analytical arm of Congress. OTA's basic function is to help legislative policymakers anticipate and plan for the consequences of technological changes and to examine the many ways, expected and unexpected, in which technology affects people's lives. The assessment of technology calls for exploration of the physical, biological, economic, social, and political impacts that can result from applications of scientific knowledge. OTA provides Congress with independent and timely information about the potential effects—both beneficial and harmful—of technological applications.

Requests for studies are made by chairmen of standing committees of the House of Representatives or Senate; by the Technology Assessment Board, the governing body of OTA; or by the Director of OTA in consultation with the Board.

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